



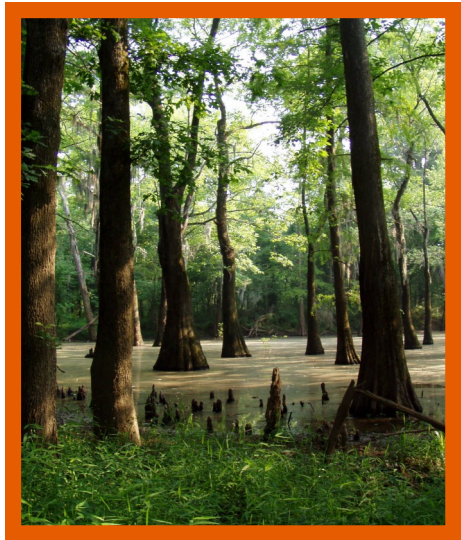
# MISSISSIPPI'S FOREST LEGACY PROGRAM

**ASSESSMENT OF NEED  
2007 - 2012**

Prepared by the Mississippi Forestry Commission - March 2007



# MISSISSIPPI'S FOREST LEGACY PROGRAM



MMNSMDWFP

## ASSESSMENT OF NEED 2007 - 2012

Prepared by the  
Mississippi Forestry Commission  
March 2007

Cover photos: Courtesy of the Mississippi Department of Wildlife,  
Fisheries and Parks, Mississippi Museum of Natural Science

Special thanks to Forestry Images for other photos.

### **Charlie Morgan**

State Forester and Chairman  
Mississippi Forest Stewardship Committee

### **Jeff DeMatteis**

State Public Lands Forester  
Forest Legacy Program Coordinator

### **Elizabeth Barber**

Barber and Mann, Inc.  
Document Compilation and Research



### **Mississippi Forestry Commission**

301 North Lamar Street  
Suite 300  
Jackson, Mississippi 39201  
601-359-1386  
[www.mfc.state.ms.us](http://www.mfc.state.ms.us)

*The Mississippi Forestry Commission provides equal employment opportunity and  
services to all individuals regardless of disability, race, age, religion, color, gender, creed,  
national origin or political affiliation.*



# TABLE OF CONTENTS

INTRODUCTION AND PURPOSE .....	1
<b>CHAPTER 1. MISSISSIPPI'S FORESTS .....</b>	<b>7</b>
The Forest Resource - Size and Location of Forests .....	7
History .....	7
Current Uses .....	11
Forest Communities of Mississippi .....	13
Mississippi Wildlife Species of Concern .....	20
Ecoregions of Mississippi - Topography, Geology and Soils .....	22
Mississippi's Climate .....	30
Soils .....	30
Streams and Watersheds .....	30
Recreational Opportunities and Aesthetics .....	32
Cultural Heritage .....	32
Mineral Resources .....	33
Timber Management Opportunities .....	33

<b>CHAPTER 2. FOREST OWNERSHIP .....</b>	<b>37</b>
Land Tenure .....	37
Characteristics of the Typical Southern Forest Landowner .....	37
Forest Ownership Trends .....	38
<b>CHAPTER 3. TRENDS AND THREATS TO FOREST RESOURCES IN MISSISSIPPI .....</b>	<b>39</b>
Fragmentation of Ownership .....	39
Restructuring of Forest Industry .....	40
Rise of Financial Owners .....	40
Cover Type Conversion .....	40
Sprawling Development/Population Growth .....	41
Projected Changes in Forests .....	43
Public Concern .....	44
<b>CHAPTER 4. EXISTING CONSERVATION PROGRAMS FOR FOREST RESOURCES IN MISSISSIPPI .....</b>	<b>45</b>
State and Federal Programs for Private Forest Lands .....	45
Non-Government Programs .....	51
Mississippi Laws, Regulations and Tax Incentives for Forest Landowners .....	54
Public Lands .....	55



<b>CHAPTER 5. IMPLEMENTING MISSISSIPPI’S FOREST LEGACY PROGRAM</b>	57
Stakeholder and Public Participation	58
Program Goals and Objectives	59
Identification of Environmentally Important Forests	60
Obtaining Interest in Land	60
Landowner Participation	60
Application	61
Selection Procedure	61
Parcel Eligibility Criteria	62
Application Deadlines	66
<b>CHAPTER 6. MISSISSIPPI’S FOREST LEGACY AREAS</b>	67
Selection of Forest Legacy Areas	67
Southeast Legacy Area	71
Northeast Legacy Area	73
Central Legacy Area	75
<b>SELECTED REFERENCES</b>	77
<b>ACKNOWLEDGEMENTS</b>	81
<b>APPENDICES</b>	
I. Letters from USDA Forest Service and Governor Barbour	85
II. Forest Legacy Statute	87
III. Forest Communities of Mississippi	91

IV. Crosswalk of Ecological Community Types with Forest Communities	117
V. MS Species of Greatest Conservation Need by Forest Community Type	121
VI. Public Comments	155
VII. Forest Legacy Program Application	163
VIII. Imperiled, Vulnerable, Threatened and Endangered Species by County	175

#### **LIST OF FIGURES AND MAPS**

1. Acres of 1992 Forest Land Converted to Development in 1997	2
2. Percentage of Unprotected Private Forest Per Watershed	3
3. Percentage of Private Forest Projected to Experience Increased Housing Density by 2030	4
4. Mississippi 2003 Land Use Map	11
5. Counties Where Timber is Dominant	12
6. Ecoregions that Encompass Mississippi	22
7. East Gulf Coastal Plain Ecoregion	23
8. Mississippi River Alluvial Plain Ecoregion	24
9. Northern Gulf of Mexico Ecoregion	26
10. Upper East Gulf Coastal Plain Ecoregion	26
11. Soil Map	30
12. The 13 Main Stream Basins/Drainages in Mississippi	31
13. Ownership of Mississippi Forestlands	37
14. Mississippi Population Change 1990 - 1997	42
15. Mississippi 2000 Population Density	42



16. Population Pressures on Forests in 2020 .....	43
17. Priority Areas in Mississippi for Biodiversity and Conservation ..	69
18. Mississippi 2000 Population Density .....	69
19. Map of Mississippi Forest Legacy Areas .....	71
20. Map of Southeast Forest Legacy Area .....	71
21. Map of Northeast Forest Legacy Area .....	73
22. Map of Central MS Forest Legacy Area .....	75

## LIST OF TABLES

1. Acreage and Percentage of Forest Types in Mississippi 1969 to 2005 .....	8
2. Forest Community Types and Subtypes by Ecoregion .....	29
3. Change in Rural Land Use in Mississippi 1982-1997 .....	35
4. Population and Forested Area of the Southeast FLA .....	72
5. Population and Forested Area of the Northeast FLA .....	74
6. Population and Forested Area of the Central FLA .....	76
7. FLP Forest Community Type Crosswalk with CWCS Habitats and NHP Ecological Community Types .....	118
8. MS Species of Greatest Conservation Need by Forest Community Type .....	123
9. S1, S2 and Threatened and Endangered Species by County .....	176





# INTRODUCTION AND PURPOSE

The Forest Legacy Program (FLP) was established by Congress in 1990 to ascertain and protect environmentally important forest areas that are threatened by conversion to nonforest uses and to promote the long-term sustainability of forest lands. To meet these goals, the FLP authorizes the Secretary of Agriculture, through the USDA Forest Service, to work in cooperation with Mississippi and other states, commonwealths, territories and tribes to acquire lands and interests in lands in perpetuity. Forest lands that contain important fish and wildlife habitats, scenic, cultural, recreational and/or water resources or other ecological values and that will support continuation of traditional forest uses receive priority in FLP.

Why is FLP important? The total area of private forest land in the U.S. has gradually declined since the mid-20<sup>th</sup> century. Increasing population and urban centers are adding demands on our forests. **Projections indicate that 44.2 million acres (11 percent) of private forests are likely to see dramatic increases in housing density in the next three decades.** Recent studies and analyses indicate trends that change is ahead and that private forests are vulnerable. Research shows that:

- ◆ Over 57 percent of the total forest land in the U.S. is privately owned.
- ◆ Between 1992 and 1997, over 10.3 million acres were converted from forest to development (Figure 1).
- ◆ Vast areas of the Northeast, Southeast, Upper Great Lakes region and





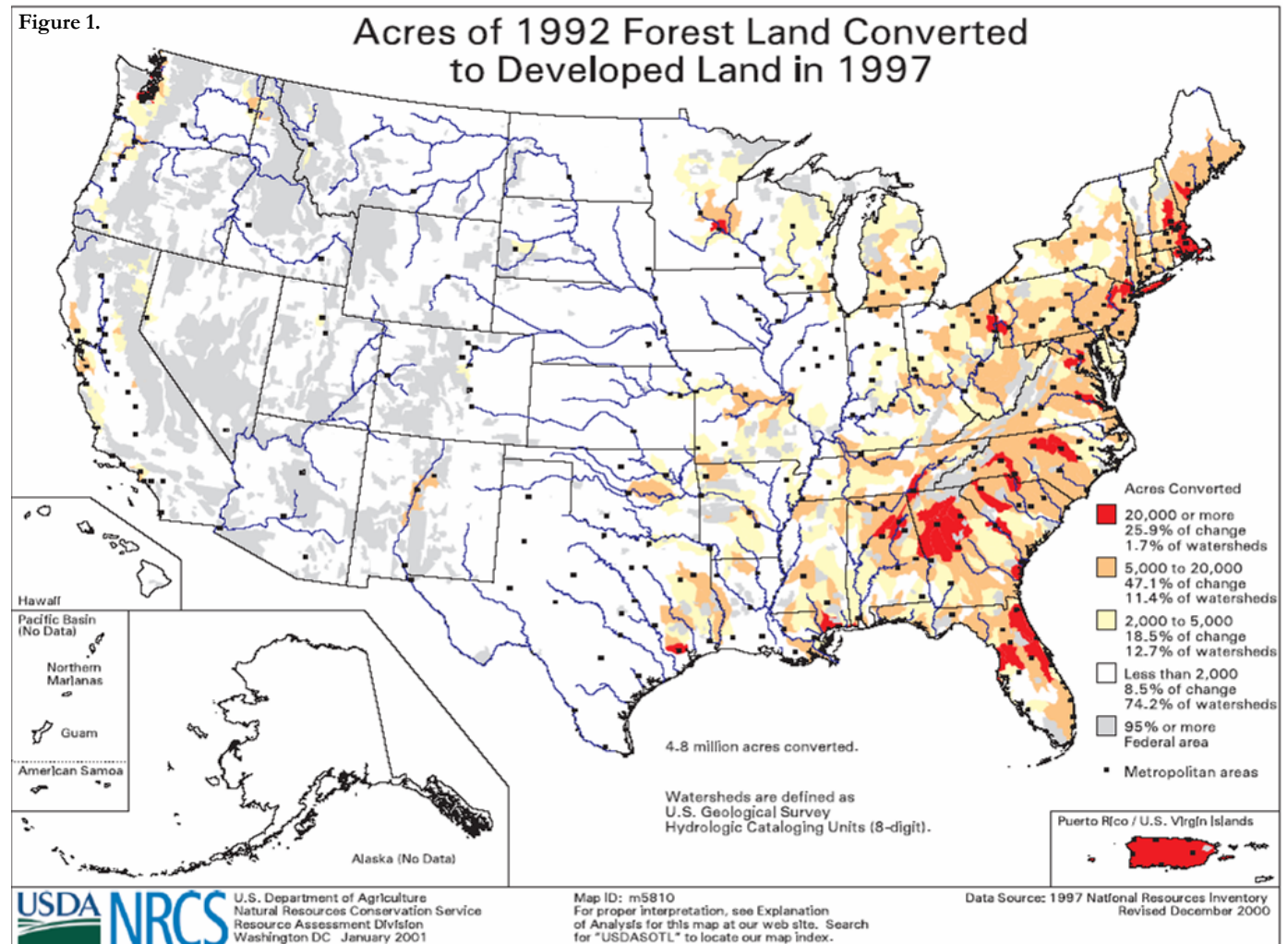
## INTRODUCTION AND PURPOSE

Pacific Northwest have high amounts of private forests vulnerable to pressure (Figure 2 - page 3).

- ◆ Forest Service analysis indicates that by 2030 increased housing density could result in significant conversion of forests in the Southeast as well as New England, the mid-Atlantic and the Pacific Northwest (Figure 3 - page 4).
- ◆ Development results in the loss of forests, smaller areas of intact forest, smaller parcel sizes and isolation of forest fragments. These changes alter the ability of private forests to provide many ecological, economic, and social benefits.

Mississippi, a state rich in forest resources, is no exception to these national trends. Its 19.8 million acres of forest land cover 65 percent of the state and most of this land, 69 percent, is owned by private, non-industry landowners. These forests supply timber products, provide wildlife habitat and watershed

protection and have recreation and aesthetic values. But increasing fragmentation and parcelization of forest across our state is resulting in the loss of these valuable ecosystems and the biological, economic and social values they provide. Many of these private forests are being



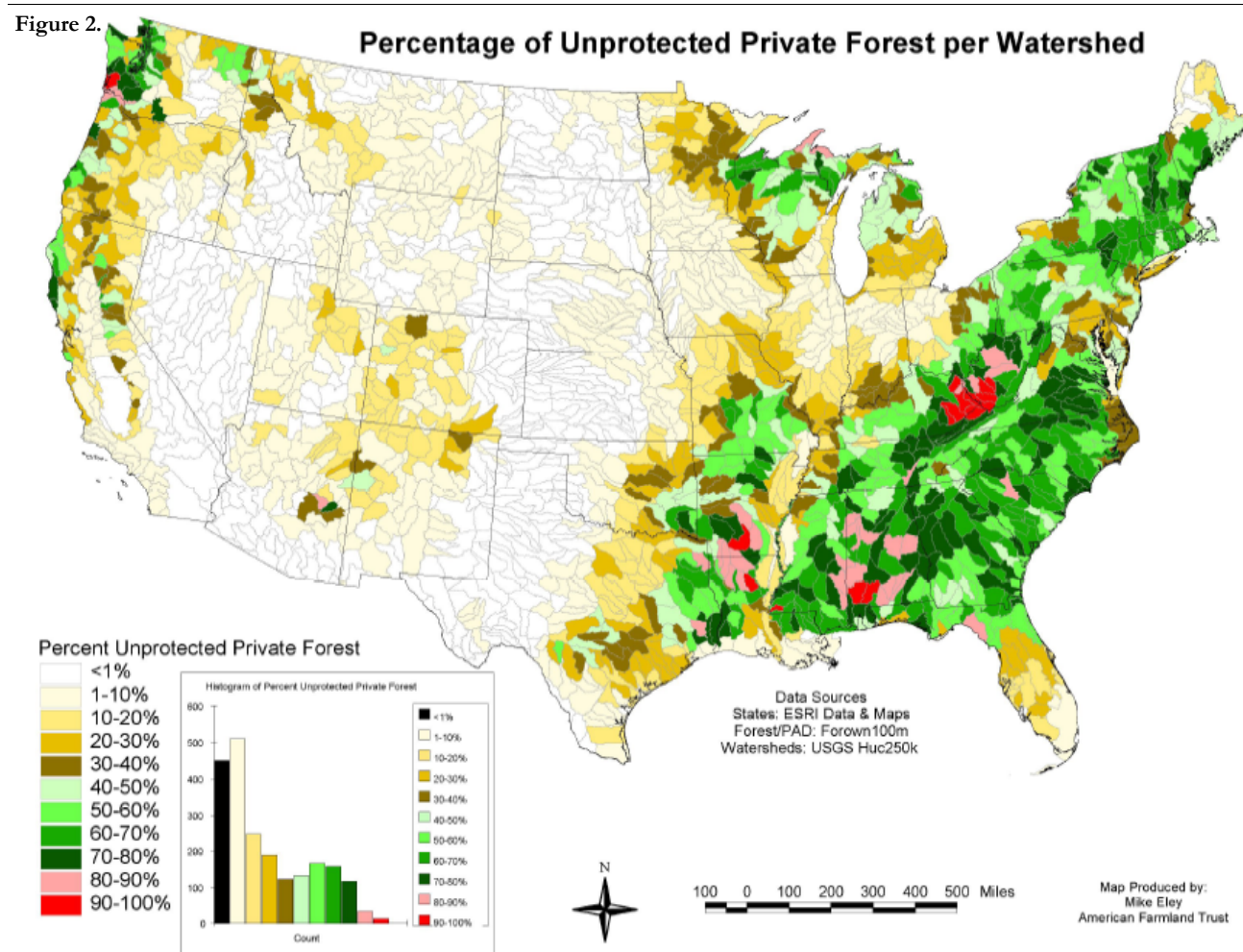
## INTRODUCTION AND PURPOSE

developed for housing, retail and manufacturing, and infrastructure and are also being subdivided into smaller and smaller parcels. Economic pressures on Mississippi forest landowners, such as escalating land values and estate taxes, lead to the conversion of rural areas into suburbs and suburban areas into extended towns and cities. Mississippi's population increased by more than 13 percent from 1990 to 2005 to 2,921,088 million people, and is projected by the U.S. Census Bureau to increase to 3,092,410 by 2030. The FLP is a voluntary program that can help protect Mississippi's forests from these and other threats.

A number of states have already qualified and been enrolled in FLP, and over one million acres have been protected in the U.S. since FLP's inception. Modifications in the program to broaden its appeal have prompted interest on the part of conservation groups and state and federal agencies in Mississippi to participate. In March, 2005, Governor Haley Barbour wrote to the USDA Forest Service Director of Cooperative Forestry expressing Mississippi's interest in participating in the FLP program and delegating the Mississippi Forestry Commission (MFC) as the lead agency (see letters in Appendix I).

In order for Mississippi to participate in the FLP, the state is required to produce this *Assessment of Need* (AON) for the program in consultation with the Mississippi Forest Stewardship Committee with public and stakeholder input. This document meets that requirement by laying a factual and procedural foundation for implementing FLP in the state. It

Figure 2.





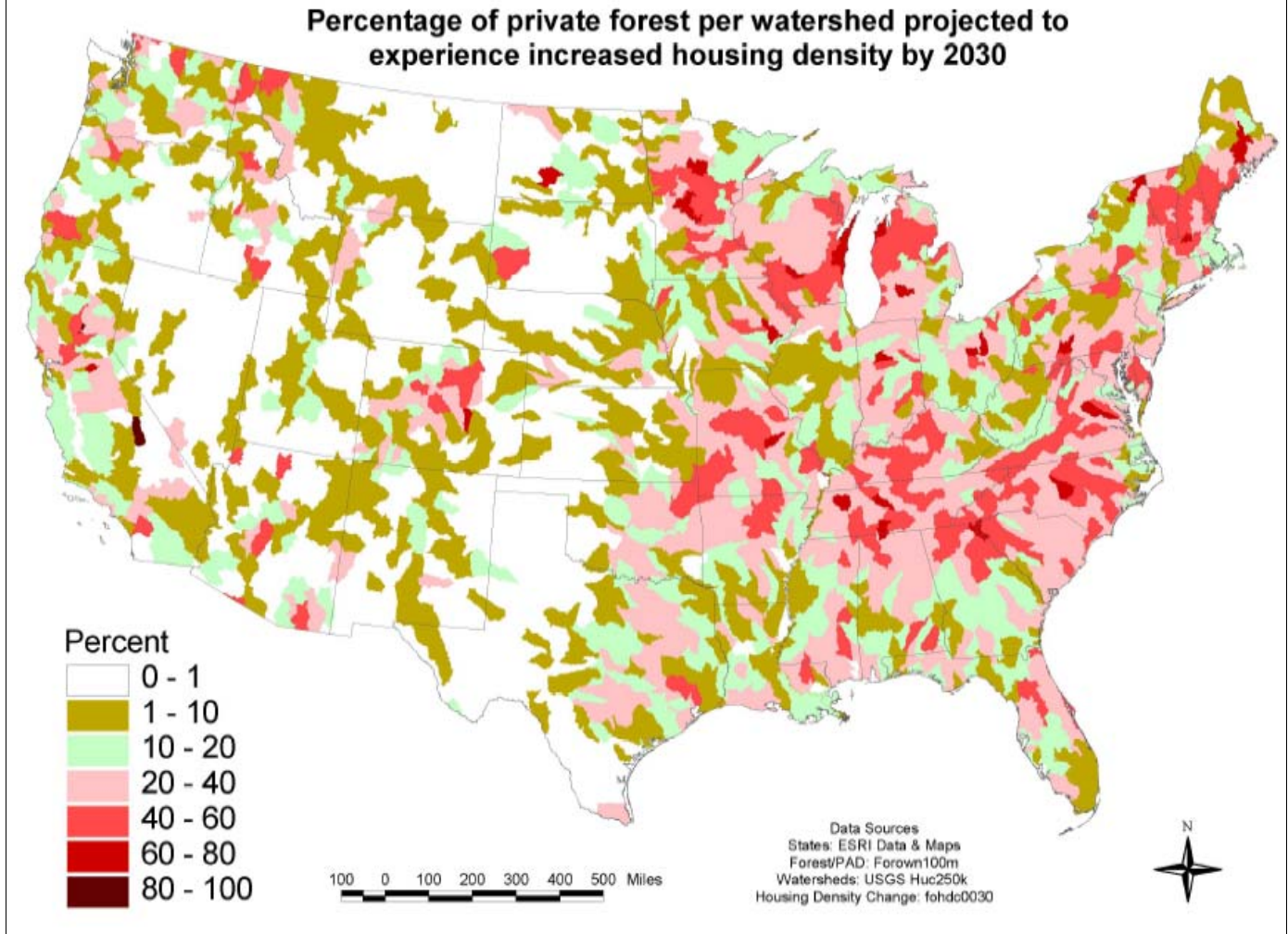
## INTRODUCTION AND PURPOSE

describes the forest resources of Mississippi, the efforts and programs available for effective conservation in the state and the process used in identifying where in Mississippi priorities for action exists.

pursued. General information about Mississippi's forest resources, the trends and threats to those resources is also detailed in this document.

This *AON* proposes three Forest Legacy Areas (FLAs) where protection efforts and funding provided by FLP should be applied if Mississippi is accepted into the program. They are the Northeast FLA, the Central FLA and the Southeast FLA. For each of the three FLAs, the *AON* identifies (1) the general characteristics and environmental values at risk; (2) describes the kinds of threats to those values in the FLA; and (3) specifies the FLA's geographic boundaries (counties and watersheds) within which priorities may be considered for the program. This *AON* also presents the evaluation criteria and scoring that will be used to rate potential parcels on which acquisition of property development rights or outright acquisition will be

Figure 3.



The **GOAL** of Mississippi's FLP as established by Mississippi's Forest Stewardship Committee and its Forest Legacy Subcommittee is *to protect environmentally important forests in Mississippi threatened by conversion to non-forest uses*. The following **OBJECTIVES** were established by the committees for Mississippi's FLP:

- ◆ Sustain native or rare and unique forest ecosystems
- ◆ Protect water quality
- ◆ Protect forests from development along lakes, rivers and buffer protected lands
- ◆ Protect wildlife habitat
- ◆ Maintain traditional forest uses, including hunting and fishing
- ◆ Sustain productive forests
- ◆ Provide public recreation opportunities

Mississippi's FLP subscribes to the *Guiding Principles* of the national FLP:

- ◆ FLP strives for permanent protection of important forestlands, utilizing high ethical standards and sound business principles. We commit to constant improvement.
- ◆ State AONs are the foundation for the FLP. They are prepared at the state level with local input. They provide strength to the program because they are developed from within each state with the best knowledge of local conditions and conservation needs
- ◆ Partnerships are a key to the success of program implementation. States and the Forest Service working with other governmental and land conservation partners, accomplish the goals of the FLP.

- ◆ Forestland is conserved and protected using conservation easements and fee simple purchase from willing landowners through partnerships, including third party transactions. Together we produce results.
- ◆ Professional forest management and traditional uses, within the conservation purposes, are encouraged and supported. Traditional forest uses, including timber harvesting, are encouraged and supported on lands protected by the FLP through multiple resource management plans and Best Management Practices. Priority is given to lands which can be effectively protected and managed, and which have important scenic or recreational values, riparian areas, fish and wildlife values, including threatened and endangered species or other ecological values.

MFC and its partners are committed to successfully implementing the Forest Legacy Program in the state, and ensuring the program meets the future needs through a five-year review and revision process.





THIS PAGE LEFT  
BLANK INTENTIONALLY.





# CHAPTER 1: MISSISSIPPI'S FORESTS

## THE FOREST RESOURCE

Mississippi is one of the most heavily forested states in the nation. According to the most recent forest survey of Mississippi, 64.85 percent of the state's land area is covered with forest totaling approximately 19.8 million acres. With the exception of the Mississippi delta, forestry is the predominant land use. These forests are 46.4 percent hardwood, 14.9 percent oak-pine and 38.6 percent pine. The amount of forest cover in Mississippi has actually increased over the past four decades primarily due to the conversion of agricultural land to pine plantations (Table 2). Forests are located statewide, but the type of forest cover varies dramatically across the state (Figure 1 - Page 2).

## HISTORY OF FORESTS IN THE SOUTH AND MISSISSIPPI

Though Europeans began to explore and settle the Southeast U.S. by the mid- and late 16<sup>th</sup> century, their impact on the native plant communities of the region was limited largely to Coastal Plain, savanna and bottomland hardwood forests. For the most part, the earliest settlements were established in coastal areas and on broad river terraces accessible by boat and barge. These areas were often cleared to make way for agriculture. Some of the clearings were made for subsistence farming, but the largest were made for commercial farming and livestock production. The quantity of timber taken during this time was limited both by technology and local demand. Consequently, large areas of upland forest in the South went essentially untouched until the 19<sup>th</sup> century.





**Table 1:**  
**Acreage\* and Percentage of Forest Types in Mississippi 1969 to 2005**

FOREST TYPE	1969	1977	1987	1994	2005
Hardwood	7,941.9	7,751.1	8,686.5	9,601.76	9,184.53
%	47	46.9	51.1	51.6	46.4
Oak-Pine	3,372.0	3,451.5	3,522.9	3,223.63	2,949.43
%	19.9	20.9	20.7	17.5	14.9
Pine	5,578.0	5,301.7	4,772.3	5,761.94	7,640.58
%	33	32.1	28	30.9	38.6
<b>TOTAL</b>	<b>16,891.9</b>	<b>16,504.3</b>	<b>16,981.6</b>	<b>18,587.34</b>	<b>19,774.54</b>

\*Acres in thousands. Source: Mississippi Forestry Association

The exploitation of natural resources, such as timber and forage, increased as population increased and as an industrial base was built in North America. Improved agricultural efficiency, a growing population, and better access to European markets by the end of the 18<sup>th</sup> century provided both the motivation and the capital necessary to expand the conversion of native vegetation to agriculture. People began to move westward into the interior of the South and began to clear increasingly large tracts of land. In this era of increased trade, additional exotic species were introduced to the South, and exotic plants that had become well established moved with the expanding population.

There was considerable curiosity in 17<sup>th</sup> and 18<sup>th</sup> century Europe about North American ornamental and medicinal plants, but most of the “botanists” of this time were collectors for wealthy Europeans and usually did not catalog the natural resources of the region. It was left to the early 18<sup>th</sup> century botanists from the Northeast to explore and

describe the vegetation of the Southeast. Most notable among these early explorers were John and William Bartram who made several journeys of botanical exploration and collection and published accounts of the natural history of the areas that they visited. In 1775, William Bartram traveled in the Pearl River basin.

Though the Bartrams books and accounts are full of details of soil conditions in various places, lists of species encountered and in some cases detailed descriptions of particular species and broad community types, including forests, savannas, glades and swamps. William Bartram also noted large areas of clearcut longleaf pine and “expansive ancient Indian fields”.

Although the Native American population had declined significantly by this time, these people were sufficiently common in the early 18<sup>th</sup> century to exert a continued impact on wide areas of the southern landscape through their agriculture and, more importantly, their use of fire as a means of manipulating vegetation. The aboriginal practice of burning the forests was adopted by European settlers soon after permanent settlements were established.

During the early 19<sup>th</sup> century, settlers moved across the region in search of quality farmland. Their agricultural practices were similar to those of the Native Americans as they cleared land primarily by girdling trees and burning the area off over a period of several years. They found the central and northern portions of the state extremely inviting due to its mix of forests and open prairies and “old Indian fields.” Much of this region was settled quickly when the Choctaw and Chickasaw tribes were removed circa 1832. The Natchez area was also favored as a place to settle and



farm due to the fertile lands and tremendous forests. Europeans selected and exploited other areas on the basis of their strategic value for military outposts or their proximity to mineral resources. These areas were less common, but usually had equally significant impacts on the local vegetation.

Lumber was needed for development during this period and the supply was considered "inexhaustible". Small mills sprang up in localized areas. Timber harvests were relatively light due to the primitive logging and milling methods that depended on animals and water for transportation and water flow for running sawmills.

In the mid-1800's, the piney woods of southeast Mississippi were considered to be infertile lands for farming and were inhabited primarily by cattlemen and hunters. In those days, any land occupied by pines was considered to be unfit for the growth of cotton and corn. In 1860, Mississippi's 16 most southeastern counties were the most sparsely populated region in the state, except for the Mississippi-Yazoo River Delta. However, one writer correctly predicted that the tremendous pine forests would one day be the center of the lumber trade for the nation.

The timber industry that had moved from the East Coast into the Lake States then migrated to the South in the late 1800s to exploit the vast expanses of pine and hardwood forest land. In 1909, Mississippi harvested over 2.5 billion board feet of lumber that represented almost 6 percent of the national harvest. Over 2.1 billion board feet of this harvest was southern yellow pine, and was the single most important species in the national supply. Douglas fir was a distant second. The cypress timber from the bottomlands was also much in demand with prices said to have

increased as much as 20-fold in a few short years. Other hardwood species were not considered to be valuable and billions of board feet were girdled and burned to clear agricultural lands.

The steam engine and the use of railroads made it possible for lumbermen to move rapidly through the Mississippi forests. Stumpage prices for southern pine increased from \$1.12 per thousand board feet in 1899 to \$3.16 in 1907. Northern lumbermen and a few from the South, purchased huge land holdings, erected sawmills and built railroads to get the logs into the mills. The logging practices of the day were destructive and often left a treeless and fire ravaged landscape. Some landowners were very farsighted and began to practice selective and seed tree harvests and conserved timber for the future. Most, however, operated until their timber supplies were exhausted and then relocated. During this period, mills could operate efficiently only when adequate supplies were available next to the rail spurs.

In the mid-19<sup>th</sup> century, clearcutting was the primary logging method employed. Modern forestry, as practiced in Europe at the time, would not become commonplace in North America until the early 20<sup>th</sup> century. In the first half of the 19<sup>th</sup> century, extensive areas of forest were leveled to create pastureland and in many places the native forest never recovered. Forested areas surrounding major river ports were extensively cut to fuel steamboats. Vast acreages of wetlands and river terraces were drained or plowed by the mid-19<sup>th</sup> century, causing significant losses to local biodiversity in some areas. Although much of this activity in the region slowed during the 1860s, logging resurged quickly thereafter. By the 1880s, a broad sector of Americans, mostly in the Northeast and West, were becoming concerned about the unbridled exploitation of the





nation's forest and wetland resources.

The evolution of forest protection laws and the establishment of national forests in the South parallel the development of the modern conservation movement in the U.S. Issues such as farmland erosion, forest clearcutting, and the hyperexploitation of buffalo were on the national conscience. The first use of the word *conservation* in the context of the protection of natural resources was in 1875, by John Warder, president of the American Forestry Association. The leadership of America's conservation movement was borne by Gifford Pinchot, John Muir, Charles Sargent, and Theodore Roosevelt.

The federal government began setting aside tracts of land as forest reserves when Congress passed the Forest Reserve Act of 1891. This legislation allowed the President to "from time to time, set apart and reserve, in any state or territory having public land bearing forests, in any part of the public lands, wholly or in part covered with timber or undergrowth, whether commercially valuable or not, as public reservations ...". Federal forest administration was consolidated under the leadership of Gifford Pinchot in 1905 with the establishment of the U.S. Department of Agriculture's Forest Service. Most of the national forests throughout the South are a result of the Weeks Act of 1911. This act broadened the mandate of the Forest Service and provided for the purchase of land, largely for watershed protection. From the time of their establishment until the beginning of the Second World War, the national forests of the South served primarily as conservation areas. National forest lands have since been critical refuges of functional native plant communities in the South.

At the turn of the 20<sup>th</sup> century, the logging industry in the South was producing lumber at its historical peak. So much forest land had been logged out that timber companies were finding it difficult to access merchantable trees and began to close mills and move to the newly opened virgin timberlands of the Northwest. Although the First World War caused a short-lived resurgence in the demand for timber and naval stores, the conversion of the shipbuilding industry to steel by 1920 caused demand for southern timber and naval stores to fall drastically. By 1930 the majority of the Coastal Plains longleaf pine communities had been essentially cut over, as had the interior shortleaf pines. Upland hardwood forests fared somewhat better in some places.

The Great Depression of the early 1930s was exceptionally difficult for the people of the South, but it helped the native plant communities of the region. The federal government purchased land and created many national forests. The Civilian Conservation Corps (CCC), established in 1933 during the Franklin Roosevelt administration, did extensive reforestation in the South. The formal teaching of forest sciences in the U.S. had finally matured by the 1920s and 1930s so that an abundance of well-trained foresters working for the USDA Forest Service, state forestry agencies, and the CCC itself were available to supervise and direct the work. The fledgling Forest Service was working to control unauthorized timber cutting on federal land. Unfortunately, this was also the time in which widespread fire suppression activities began. Although this practice was well intentioned at the time, it eventually led to significant declines in native plant communities throughout most of the Southeast.



The timber industry in the South remained depressed until the outbreak of the Second World War. At about the same time, serious scientific research was started at government and university labs to increase the productivity of forest land. Much of this work focused on the development of “improved” tree selections and cultivation practices. One of the innovations that arose was the culture of pines in plantations.

Growing plantation pines turned out to be exceptionally productive. Newly developed tree selections thrived in the prepared conditions of the plantation. Large tracts of cutover land, especially in the Coastal Plain and Piedmont, would eventually be converted to pine plantations. This method focused timber production on developed sites. Although those sites were forever altered, this intensive form of silviculture saved many acres of native forest from more traditional timber harvesting.

The next large threat to native plant communities in the South came from another, unlikely advancement in technology. From the time of settlement the South was largely rural, agrarian and sparsely populated. The widespread availability of air conditioning in the 1950s and 1960s made living and conducting business much easier in the sweltering heat of southern summers. The South, therefore, began to see significant increases in immigration and urbanization. Land was developed, and large tracts were fragmented. These trends led to rapid increases in demand for building materials, electricity and additional agricultural production.

Improvements in technology and mechanization (especially in agriculture) and decreasing federal commodity price supports led to significant consolidations in the timber and farm industries. Former farmers migrated to cities in the North and South. In the 1940s, 42 percent of the

population in the South lived on farms. By the 1950s, only 15 percent of Southerners lived on farms. The majority of the population of the region became isolated from the landscape, forever changing the way Southerners viewed their forests.

After the end of the Second World War, pine forests in the South, including those on state and federal land, were predominantly managed for timber production. The birth of the modern conservation movement in the 1960s came, in part, as a reaction to concerns about public land management priorities and the lax enforcement of environmental laws.

## CURRENT USES

In addition to timber production, Mississippi’s forests provide significant recreational and tourism opportunities, aesthetic value, wildlife habitat, water quality protection and other environmental benefits. Only 11 percent of Mississippi’s forest are owned by government. Eighteen percent is in the hands of forest industry and 72 percent belongs to private, non-industrial landowners. Most of Mississippi’s private forestlands are maintained for economic returns from the sale of timber as a primary or secondary objective. Other major uses include

**Mississippi 2003 Land Use Map**



**Figure 4: Map of Current Land Use**





management for hunting of game species such as white-tailed deer, wild turkey, squirrels or for wildlife viewing and aesthetics. Most Mississippi landowners do not have an established, formal plan for managing their property. While they do not consider the need for a management plan until they decide to harvest timber, an increasing number of Mississippi landowners have varied management objectives and actively seek technical assistance from state or federal agencies or conservation organizations.

Mississippi's forests and the industry they support contribute \$14 billion to the state's economy and directly employ 52,580 people paying \$1.6 billion in wages each year.

Timber is an important agricultural crop in the local economy of virtually every county outside the Mississippi delta. In any year, timber will be among the three most valuable agricultural crops in 65 to 70 of the 82 counties in the state.

Mississippi's forest products industry consists of four major sectors:

- ◆ **Solid wood products** which includes pine and hardwood lumber, plywood, poles, oriented strand board and other "composite" forest products.
- ◆ **Pulp and paper** which includes fine writing papers, "liner-board" used for cardboard boxes, tissue and absorbent papers and market pulp.
- ◆ **Wood furniture** and related products which consist mostly of upholstered wood furniture such as couches, love seats and recliners.

- ◆ **Timber harvesting** which includes the harvesting and transportation sector.

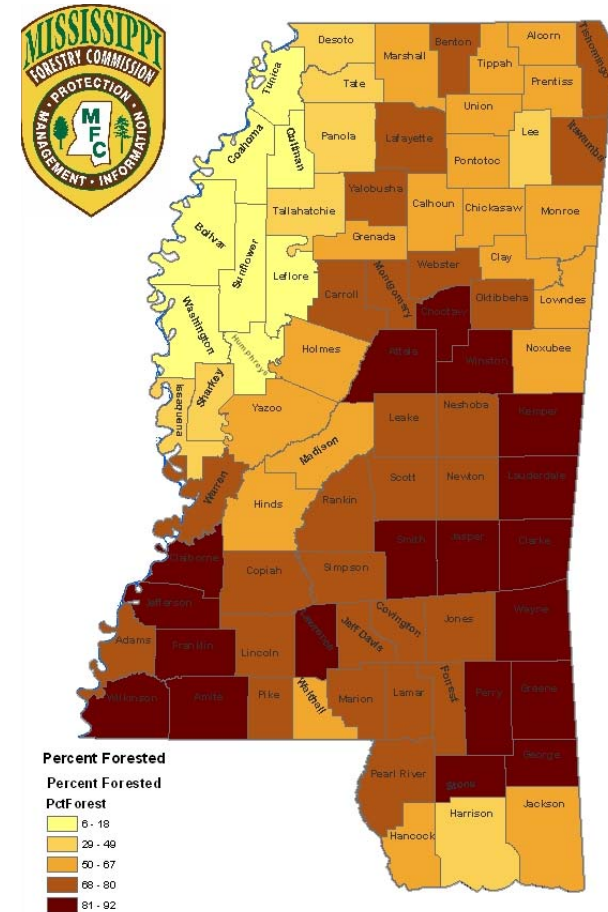


Figure 5: Counties where timber is dominant



## FOREST COMMUNITIES OF MISSISSIPPI

A community is collectively, all of the organisms inhabiting a common environment and interacting with each other. The Mississippi Natural Heritage Program (NHP) has identified at least 159 natural, semi-natural, managed, weedy and probable community types in Mississippi that include 77 forest types. Those community types have been assigned priority conservation ranks indicating their relative endangerment or abundance (see conservation status and ranks in Appendix III). In 2005, the Mississippi Department of Wildlife Fisheries and Parks (MDWFP) led an effort to develop the state's first *Comprehensive Wildlife Conservation Strategy* (CWCS) as part of a nationwide effort to improve biodiversity of fish and wildlife species. The CWCS condensed the 159 community types into 64 sub-types with a description of each community, the wildlife and fish species of concern associated with each type and identified the major threats and potential conservation actions needed to abate those threats. The community types were also ranked for the purposes of prioritizing the community types that need immediate conservation action. Twenty of the 64 community subtypes are predominantly forested and fall in to nine major forest types:

- ◆ Dry-Mesic Upland Forest/Woodlands
- ◆ Old Fields, Prairies, Cedar Glades and Pine Plantations
- ◆ Mesic Upland Forests
- ◆ Bottomland Hardwoods
- ◆ Riverfront Forests
- ◆ Wet Pine Savannas/Flatwoods
- ◆ Spring Seeps
- ◆ Swamp Forests
- ◆ Upland Maritime Woodlands



A short description of each of these nine major forest types follows. A full description of the 20 forest community subtypes is in Appendix III that includes information on their geographic location, size, condition and conservation status and ranks as excerpted from the CWCS.

### A. DRY TO MESIC (DRY TO MODERATELY MOIST) UPLAND FORESTS/WOODLANDS

These upland forests have limited nutrient and/or moisture availability due to the nature of the soils, which are shallow, coarse-textured and well drained. Subtypes of this category include dry to moderately moist hardwood and pine forest associations. Mixed pine-hardwood habitats are classified as either pine or hardwood subtypes, depending on whether pines or hardwoods are more abundant. Fire once played an important role in maintaining these habitats by reducing densities of young saplings, recycling nutrients and oxidizing ground litter.



**This forest type includes four subtypes: Dry Hardwood Forests, Dry Longleaf Pine Forests, Dry-Mesic Hardwood Forests and Dry-Mesic Shortleaf/Loblolly Pine Forests.**

Although there are no estimates of the losses of dry-mesic upland forests/woodlands in Mississippi, it is possible to envisage their overall

condition by understanding the extent of development pressure generated on these habitats. Historically, large areas of upland hardwood and pine forest were converted to agricultural croplands and pasture. The tracts that were chosen were selected from the areas containing the most productive landforms and soils. Most landforms of the coastal plain are not excessively steep or isolated and are therefore easily accessible to either timber management or agricultural usage.

Today, typical upland forests lack a diverse understory and exhibit very high stem densities. Many commercially managed forests have been converted to pine plantations and, on national forest lands, the trend for the past 50 years has been to promote pine reproduction over that of indigenous hardwood trees. Upland forests of Mississippi benefit from prescribed burning, but timberlands and protected forestlands, such as national wildlife refuges and lands adjacent to Corps of Engineers' reservoirs, are somewhat degraded due to limited exposure to fire, though continued efforts to increase burning on national forest lands are promising. Also, reproduction for some important trees, such as several oak species, is often hampered by current management systems.

In general, it is likely that more than 90 percent of upland forests of Mississippi have been severely degraded or lost and the condition of the remaining could only be regarded as fair. With an increased interest in conservation, possibly through sustainable forestry practices such as the single tree select cut system of timber harvesting, and a renewed interest in forest restoration on private and public lands, these systems may improve.

## B. OLD FIELDS, PRAIRIES/CEDAR GLADES AND PINE PLANTATIONS

This category is a collection of naturally occurring prairies/cedar glades and the artificial constructs of agriculture and forestry (pine and hardwood plantations, young hardwoods and old clearcuts). These subtypes occupy a wide range of landforms, soils and moisture conditions.



MISSISSIPPI

**This type includes three forest subtypes: Northeast Prairie/Cedar Glades, Pine Plantations, Old Fields and Young Hardwoods (Shrublands).**

There are no accurate records of historical acreage for the Northeast Prairie of Mississippi; however, estimates suggest that approximately 100,000 acres once existed in northeast Mississippi, some of which included Indian old fields. Historically, the prairies were converted to agriculture uses by the early settlers. A majority of the Northeast and Jackson prairies remain under cultivation for cropland and pasture, or have degraded into cedar glades or grassy fields or have converted to woodland. Some areas exhibit erosion scars, chalk outcrops and weedy aspects. Some gullied lands are being re-graded and converted to fescue pastures. Prairie vegetation is still found on many of the eroded sites, although much is in poor condition. The prairies that exist today occur on forest edges, in pastures, utility corridor rights-of-way and road





ditches that are maintained in grass by mowing.

A large percentage of the land surface area of Mississippi is in various stages of regeneration following logging, cropping, or natural disasters, such as catastrophic fires or windstorms. Recent land use/land cover classification studies based on satellite imagery indicate that approximately 35 percent of Mississippi is non-forested and is dominated by shrubs, small trees or herbs. The land use/land cover estimates indicate that there are over four million acres of scrub-shrub habitat and nearly seven million acres of pasture/grassland. As agriculture lands go out of production, there has been steady increase in the acreage of pine plantations.

### C. MESIC (MODERATELY MOIST) UPLAND FORESTS

Upland forests that are not limited by nutrient or moisture availability are considered moderately moist. Landforms supporting this type are those positioned on the middle to lower slopes, low flats or protected draws. The soils are

usually deeper, moderately fertile, consist of loam or clay and have higher moisture holding capacities than those of dry to moderately moist categories. Hydric features, characteristics of wetland soils, are normally not found in the upper horizons of these soils.



MMNS/MDWFP

**This type includes four subtypes: Beech/Magnolia Forests, Mesic Longleaf Pine Savanna/Forests, Loess Hardwood Forests and Lower Slope/High Terrace Hardwood Forests.**

The diversity of the hardwood and pine forest communities have decreased due to land clearing, overcutting, introduction of invasive species, especially Chinese privet, erosion and the suppression of fire over long periods. Being situated on gently sloping landscapes with relatively deep and fertile soil, the mesic forest types were more likely to be converted to agriculture. The loess forests of Mississippi, which are found on steeper terrain, have remained somewhat intact. However, development surrounding the urban centers of Memphis, Vicksburg, and Natchez is causing significant fragmentation of the loess forest community.

Mesic longleaf forests once formed an extensive blanket across the uplands of the Piney Woods region but were logged during the last two centuries. Second growth forests, many of which were converted to other pines, now occupy the undulating hills and plains of the region. Because of the current emphasis on timber production, longleaf pine stands are even-aged and have much higher stocking densities. Although significant land conversion has occurred, longleaf forests are common on national forest lands and some private holdings. Also many areas have lost their coverage of beech/magnolia trees. However, beech and magnolia remain as the dominant trees in isolated coves, draws and on steeper terrain, especially across the loess hills south of Vicksburg, in patches on national forest lands and on bluffs or upper terraces of major river systems. Forest management practices that prevent logging in streamside zones, designed to help improve water quality of streams, also



help conserve lower slope/high terrace hardwood forests. The expansion of terrace hardwoods onto slopes is a modern condition resulting from the suppression of fire. Conditions described for dry-mesic upland forests also apply to these forest communities.

#### D. BOTTOMLAND HARDWOOD FORESTS

Bottomland hardwood forests occur in river floodplains that receive periodic inundation from rivers during heavy rainfall events. Bottomland terraces are irregularly flooded for durations of several days to a month or more. On these lowland sites, the water table remains elevated during the winter and spring seasons and soils remain moist through much of the growing season. Their soils are less acidic and are enriched by the influx of nutrients and sediments during floods. Bottomland forests are considered palustrine. The palustrine communities are composed of hydrophytic plants that grow and persist despite periodic low oxygen conditions in the soil.

**Bottomland hardwood forests and swamps make up parts of three forest communities – bottomland hardwoods, riverfront floodplain forests and swamp forests.**



MMNS/MDWFP

Bottomland hardwood forests and swamps were once common in the Southeast. During the last century, the most dramatic wetland loss in the entire nation occurred in forested wetlands of the Lower Mississippi River Alluvial Plain region, which includes the Mississippi delta region. Of an estimated 24 million acres of the original bottomland hardwood forests, only 5.2 million acres (22 percent) remained in 1978. Fifty-six percent of southern bottomland hardwood and bald cypress forests were lost between 1900 and 1978. Only 15 percent of the Mississippi delta remained forested and the largest segment remaining is the complex of forests about 100,000 acres in size within and surrounding the Delta National Forest. The largest patches of bottomland forests are the wet bottomland types that contain few tree species. However, significant areas of bottomland hardwood forests remain in the mid-South region, mainly situated in the Mississippi River Valley. By classifying the forests into Society of American Forest cover types, it is estimated that over 2.5 million acres of moderately wet bottomland forest and over 0.6 million acres of very wet bottomland forest remain in the lower part of the Mississippi River Alluvial Plain within Mississippi, Arkansas and Louisiana.

The primary cause of bottomland hardwood losses has been conversion of these lands to agricultural production. Additional losses have been caused by construction and operation of flood control structures and reservoirs, surface mining and urban development. The moderately wet forest types are increasingly fragmented due to improved road access, increased agriculture usage (i.e., pastures and fencing) and closer proximity to development. The wetter tracts are less fragmented but have lost many of their original functions. They are somewhat less vulnerable to disturbances because moisture conditions prevented access



to these lands. Human activities along streams and other bottomland communities have had, and continue to have, a negative impact in this habitat.

### E. RIVERFRONT PALUSTRINE (MOIST) FLOODPLAIN FORESTS

Riverfront soils are lower in organic matter and have higher pH than soils of other bottomland hardwoods. New soils in accretion zones range from fine clay to coarse sand, depending on flow velocities at the time of sediment deposition. Backwater areas contain finer textured substrates and point bars are sandier.

The moisture level of riverfront substrates depends on river stage, which is high in the spring, causing saturation or flooding, and low in the fall, bringing drier conditions.



MMNS/MDWFP

Flooding along the riverfront areas reworks sediments from river banks, sandbars and point bars to form new channels, submerging some areas and building new lands elsewhere. Wet exposed mineral soils provide open habitats for cottonwood and willow to germinate. The dominant trees of these areas germinate best in exposed mineral soil, grow rapidly once river levels fall and must tolerate submersion and sediment accumulation. Sedimentation degrades aquatic habitats and kills aquatic organisms, including fish. Riverfront forests, which control shoreline erosion and intercept eroded soil from upland areas, effectively reduce the amount of sediment reaching rivers and streams.

**This natural community type includes one forest subtype:**

### Cottonwood/Black Willow/River Birch Woodlands

Dams, channelization, manmade levees and other modifications have restricted the extent of riverfront forests. Bank erosion-accretion processes has been slowed or eliminated along leveed and stabilized portions of the Mississippi River. The modified river environment has caused the riverfront cottonwood and willow communities to regenerate poorly.

Although much diminished after river diking, dredging, revetment and channelization projects, the lands between the Mississippi River and its levees still contain the long swaths of riverfront forests. It is estimated that over 500,000 acres of cottonwood-willow forest remains in the lower Mississippi River Alluvial Plain within Mississippi, Arkansas and Louisiana. Rivers confined to the western portion of the state and flow into the Mississippi River, such as the Big Black and Sunflower, are dramatically impacted by the stages of the Mississippi River, which significantly alters their rate of flow and sediment deposition.

### F. WET PINE SAVANNAS/SLASH PINE FLATWOODS

Wet pine savannas and flatwoods are found on low, wet, rain-fed coastal flats, foot slopes, depressions and along drainageways. Wet pine savannas receive moisture through precipitation and are not subject to riverine flooding. Soils are composed of highly weathered, acidic, infertile substrates. The high precipitation and low evapotranspiration rates during the winter and spring season along the coast creates a surplus of moisture that gradually percolates through the soil profile. Nutrient deficient soils develops on these wet flats because nutrients released by





weathering are insufficient to replace those removed by leaching.

**This forest type includes two subtypes: Wet Pine Savannas and Slash Pine Flatwoods.**

It is estimated that less than five percent of the original acreage of wet pine savanna habitat remains in the Atlantic/Gulf Coastal Plain making it one of the most endangered ecosystems in the country. The lack of prescribed burns has had a dramatic negative impact on the size and distribution of wet pine savannas. Fire suppression allowed pines and shrubs to invade and out-compete the native savanna plants. In the 1960s and 1970s, much of the remaining open savanna was converted to pine plantation by planting and ditching (bedding); the latter disrupted the natural water regime. Additional urbanization of the three coastal counties of Mississippi caused significant losses of this habitat. The savannas of Sandhill Crane National Wildlife Refuge are considered the last remaining large patches of this diverse community.



Slash pine flatwoods have also been adversely impacted by timber harvest, clear-cutting and plantation monoculture. If fire is excluded, the open, herbaceous character of pine flatwoods ground cover is lost, while evergreen shrubs increase in dominance. Contributing to these factors is

the dry mat of acidic pine needles which inhibit the growth of most herbaceous species.

**G. SPRING SEEPS**

Springs form when groundwater resurfaces after flowing laterally over less permeable substrates, which place the water table above the spring. Cracks or sloping impermeable strata tend to direct the flow towards the spring head. Springs were important watering points for early settlers but also have ecological importance, especially by providing a moist environment for amphibians. Today, some springs produce commercial spring water. Spring seeps often contain rare plants and may be the only wetlands available to local animal populations during droughts. Larger spring-fed wetlands are considered in swamp, bog or other wetland categories within this *Assessment of Need* or within the habitat subtypes of Mississippi's *CWCS*.

**This type includes two subtypes: Hardwood Seeps and Pine Seeps.**

Seeps occur throughout Mississippi but are infrequently found in the blackland and interior flatwoods regions of the state. They are more abundant in regions with steep terrain such as the loess hills, Tennessee River hills, and the rolling hills of the longleaf pine region. The number of seeps in Mississippi is unknown and no study of their condition is available. The Mississippi NHP has documented a limited number of spring seeps. Some seeps are destroyed during highway construction by cutting through the vein that provides moisture or by intentionally capping with impermeable materials in efforts to preserve the roadbed. Surrounding land uses will affect the condition of spring seeps. In one instance for example, a seep which supplied moisture to a highly diverse



bog was destroyed by the removal of sand and gravel from a nearby hill. Surface and gully erosion will reduce moisture availability to springs by changing subsurface flow patterns. In some instances seeps are less likely to be impacted by humans, as the nature of the saturated soils makes it difficult to carry out standard logging practices or imprudent to construct buildings within the seepage zone.

## H. SWAMP FORESTS

There are about 600,000 acres of swamp habitat in Mississippi, equivalent to about two percent of the state land area. Oxbow lakes, low floodplain terraces, bottomland flats, backwater areas or springheads are common areas to find swamp forest vegetation. The soils of swales or depressions are seasonally to semi-permanently flooded and remain saturated for long periods throughout the year.

**There are two swamp forest subtypes occur in Mississippi: Bald Cypress/Gum Swamp Forests and Small Stream Swamp Forests.**

Bald cypress/blackgum/water tupelo swamps are found in depressions associated with riverine floodplains. The second subtype, small stream swamp forests, include wet pond cypress depressions, white cedar swamps and bay swamp forests.

Centuries of land clearing and development have seriously impacted southern swamplands. Despite dramatic losses the region currently accounts for about 36 percent of all wetlands and 60 percent to 65 percent of all forested wetlands. Although loss rates have declined recently, most wetland acreage lost every year in the country is from southern forested wetlands. Annual loss rates of forested wetlands for

the period from 1960 to 1975 was estimated to average 0.5 percent in Mississippi. The USDA Forest Service inventories completed by the early 1990's indicate continued annual loss rates of 0.7 percent and 1.0 percent for the oak-gum-cypress forest type in the Louisiana and Mississippi portions of the Lower Mississippi River Alluvial Plain. Estimates of a million acres of cypress-tupelo swamp remain in the Lower Mississippi River Valley, within the states of Louisiana, Arkansas and Mississippi.



MISSISSIPPI

In the past, wetlands have been regarded as a menace and a hindrance to land development and were considered mere wastelands, made valuable only if drained. During the mid-19th century, Congress passed the Swamp Lands Acts of 1849, 1850 and 1860, granting swamp and periodically flooded bottomlands to the states. Five southern states received 40 million acres for draining. Most wetlands were drained for conversion to agriculture. Large-scale federal navigation, flood-control and drainage projects have played a large role in these conversions by making previously flood-prone lands dry enough for planting crops. The increase in the population of the South has accelerated the rate of wetland losses. Conditions around the state range from losses of around 80 percent in the Delta to more natural conditions in parts of the



Pascagoula River watershed. The Pascagoula River is the largest unimpeded main stem river in the lower 48 states surrounded largely by bottomland hardwoods and coastal marsh.

## I. MARITIME WOODLANDS

Maritime woodlands are found on the barrier islands and the mainland coastline of Mississippi. Many of the barrier islands, parts of which are considered wilderness, remained in good condition prior to Hurricane Katrina which made landfall in August, 2005. This hurricane storm caused overwash and additional destabilization of the fragile dune systems. The barrier islands are gradually diminishing in size by wave erosion and reduced sand accretion. Exotic weeds, which have gained footholds on the mainland in pine flatwoods and savannas, live oak woodlands and shell middens, as well as on the islands, will continue to reduce the condition of these landscapes.

The maritime slash pine flatwood/savannas community marks a scenic backdrop to the intertidal marshes along Mississippi's coastline. This community occupies ancient low shoreline beach ridges and low flats

situated immediately inland from the tidal marshes. It is also found on the terrace levees of many tidal creeks, occasionally extending into the midst of sprawling black needlerush marshes. In accompaniment with the pine flatwoods, are coastal live oak woodlands situated on prominent



NMNS/MDWFP

coastal cheniers and ancient beach ridges that straddle the coast line. The liveoak woodlands are comprised of native live and upland laurel oaks and contain an understory often dominated by saw palmetto. Most of the coastal upland habitat has been urbanized. Therefore it is likely that the maritime liveoak forest is one of the rarest communities found in Mississippi.

The community is fire dependent and can become brushy and inaccessible to pedestrian traffic during long intervals between burns. Maritime woodlands, including maritime liveoak forests provide essential points for neotropical migrants staging their trans-gulf journey in the fall and recuperating upon their return in the spring.

Like other coastal states, the use of coastal areas as industrial, urban and residential centers has disturbed much of the natural landscape surrounding coastal wetlands in Mississippi. Over half of the U.S. population lives within 50 miles of the coast and this population is growing at a much faster rate than inland regions. This rapid urbanization of our coasts has destroyed a significant amount of coastal wetlands and fringe habitats, degraded coastal water quality, and severely stressed other coastal ecosystems. A healthy coastal economy depends on healthy coastal ecosystems. According to the U.S. Census, the population in Mississippi's three coastal counties dropped by 50,000 people after Hurricane Katrina. However, significant reconstruction is occurring and this population change may be temporary.

## MISSISSIPPI WILDLIFE SPECIES OF CONCERN

Mississippi has 80 species and subspecies of plants and animals which are officially recognized as endangered – some by the state and some by the





U.S. Fish and Wildlife Service (USFWS). Forest communities are important for many wildlife species of concern as well as many rare plants and for common species. Maintaining and restoring, where possible, natural forest communities with appropriate structure and composition and of sufficient size on the landscape is critical to the survival of these species.

Appendix V is a list of wildlife species of concern in Mississippi that depend on forests for some portion of their life history, though they differ greatly in their habitat requirements. This information was taken directly from Mississippi's *CWCS* which identified 297 wildlife species of concern (except gastropods and insects) in the state and the habitats on which they depend for survival. This list separates the animals by group and forest subtype and also indicates the state and global heritage rank of each species and its status as a state or federally protected species.

The conversion and/or changes in structure and composition of Mississippi's natural forest communities have spurred the decline of many species of concern. The black pine snake, a federal candidate species, and the threatened gopher tortoise prefer longleaf pine forests with sandy soil, an open canopy, moderately fire-suppressed midstory and thick, grassy understory. Fire suppression, fragmentation of their habitat and road construction have contributed to the decline of both species.

The federally endangered Mississippi sandhill crane inhabits coastal pine savannas and associated bayheads and swamps for nesting and feeding. Thousands of acres of savanna on private lands are now unsuitable for the cranes because of their conversion to dense pine plantation and changes in hydrology resulting from drainage canals. Thus the crane is

dependent on public land for its survival. The red-cockaded woodpecker has become an endangered species because of its dependence on mature pine forests with an open understory. The decline of this species began with the widespread cutting of virgin pine forests in the late 1800's. Its survival today is also dependent on the proper management of public forestland, because the maintenance of mature forests on most private lands is unlikely.

The black bear probably lived throughout Mississippi in the past, but appears to be restricted to bottomlands along the Mississippi, Lower Pearl and Pascagoula rivers today. Conversion of large tracts of hardwoods and over hunting have almost eliminated the black bear from the state.

Though Mississippi does not have an endangered species designation for plants, there are also many plant species of concern that depend on forests communities. For example, the pondberry or Southern spicebush, listed as endangered by the USFWS, is associated with the interior areas of bottomland hardwoods as well as sinks, ponds and depression in coastal areas and tend to grow in shaded areas. Drainage and conversion of their habitat to other uses by timber harvesting and cattle grazing has contributed to the species decline. The threatened Price's potato bean occurs in open woods and along woodland edges in limestone areas where bluffs grade into stream bottoms in northeast Mississippi. Shading and competition, clearcutting, grazing, road right-of-way construction have caused populations to decline.

Another example is the Louisiana quillwort, a perennial wetland herb that is a primitive relative of true ferns. Plants have been observed in Jones,



Wayne, Greene, Forrest, Perry, Stone, Harrison, Jackson, Hancock and Pearl River Counties on public and private lands. Quillworts grow in mineral soils in bottomlands and along streams. Certain silvicultural activities, military training, and use of all-terrain vehicles as well as natural alterations from stream impoundments may contribute to adverse impacts on quillwort habitat.

Mississippi is also an important migration route for many neotropical migrant songbirds. Radar from the Pascagoula River basin shows wave after wave of migrants moving up the river to their northern breeding grounds. Mississippi is also the last staging area for migrants as they embark on their fall southerly trans-gulf migration and is the first landfall for the northerly trans-gulf migration.

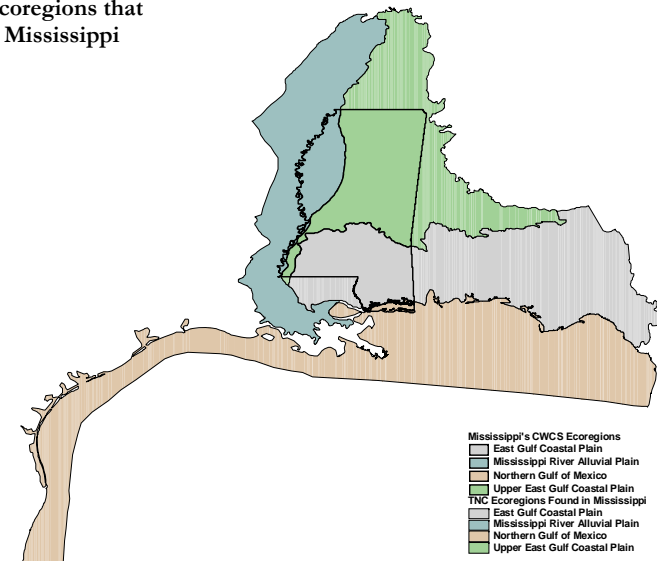
While public lands are important in the conservation of many species of concern in the state, private lands offer significant opportunities for management, protection and restoration of habitat for forest-dependent species.

### ECOREGIONS OF MISSISSIPPI - TOPOGRAPHY, GEOLOGY AND SOILS

Bailey/US Forest Service Ecological Units as modified in 1998 by The Nature Conservancy (TNC) are being used as the ecological platform for Mississippi's Forest Legacy Program *Assessment of Need*, because of their wide acceptance within the ecological community and their use in Mississippi's 2005 *CWCS* produced by the MDWFP.

Ecoregions are commonly considered to large areas distinguished from surrounding regions by differing biotic and environmental factors and/or

Figure 6. Ecoregions that encompass Mississippi



ecological processes. Factors that are generally used to distinguish these large regions from one another include differences in climate, physical geography, soils, species or communities. Using similar criteria, TNC delineated ecoregions across the United States and were the first to use ecoregions as a basis for comprehensive conservation planning on a national scale. They define ecoregions as:

*...relatively large units of land delineated by large-scale abiotic and biotic factors that broadly shape the structure and function of biological communities within them.*

The following are descriptions of the four ecoregions that encompass Mississippi, as directly excerpted from TNC's respective *Ecoregional Plans*. They are:

- ◆ the East Gulf Coastal Plain (EGCP)
- ◆ the Mississippi River Alluvial Plain (MSRAP)
- ◆ the Northern Gulf of Mexico (NGM) and
- ◆ the Upper East Gulf Coastal Plain (UEGCP)



All Mississippi forest communities described earlier have been identified by ecoregion for planning purposes and are described on the following pages and in Appendix III.

### EAST GULF COASTAL PLAIN ECOREGION

The EGCP ecoregion includes portions of five states (Georgia, Florida, Alabama, Mississippi and Louisiana) and over 42 million acres. It stretches from southwest Georgia across the Florida panhandle and west to southeastern Louisiana. The ecoregion has a diversity of ecological systems, ranging from sandhills and rolling longleaf pine-dominated uplands to pine flatwoods and savannas, seepage bogs, bottomland hardwood forests, barrier islands and dune systems and estuaries. The meager topographic and soil diversity of the EGCP suggests an area of low biodiversity and endemism, yet the ecoregion is one of the biologically richest in North America. Many species, particularly vascular plants, reptiles, amphibians and fishes occur only in this ecoregion, and many of those are even more narrowly limited within the ecoregion.

This ecoregion is physically characterized by subtle topography, a warm to hot, humid maritime climate, and soils derived primarily from unconsolidated sands, silts and clays transported to the ecoregion by the weathering of the Appalachian Mountains. Other features include a high percentage of land area in

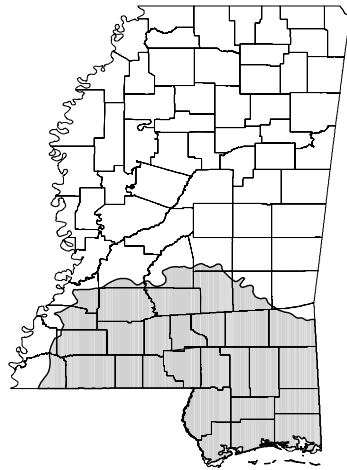


Figure 7: East Gulf Coastal Plain Ecoregion in Mississippi

wetlands, a dominant role of frequent fire over the majority of the landscape, a diversity of river and stream systems, limited but important karst areas, diverse estuarine and tidal systems and significant large scale disturbance events such as hurricanes.

This ecoregion experiences high species richness, species endemism, and community diversity in terrestrial, freshwater and aquatic systems. Part of the reason for this is that the ecoregion has never been glaciated, and has been continuously occupied by plants and animals since the Cretaceous period, giving ample time for the evolution of narrow endemic species.

The dominant ecological drivers of the terrestrial systems are soils (texture and chemistry), fire frequency and hydrology. Inland, longleaf pine woodlands are dominant over most of the landscape, on upland and wetland sites and a wide variety of soils. These pinelands (sandhills, clayhills, flatwoods and savannas) support a tremendous diversity of plant and animal species: most of them unique to these systems. Embedded in these pinelands, specialized patch communities such as seepage bogs, treeless “savannas” and “prairies”, and seasonally flooded depression ponds provide rich habitat for plants, amphibians, and invertebrates. Imperiled plant species are concentrated in fire-maintained pinelands (wetland and upland), associated seepage bogs and upland depression wetlands and barrier island communities. While many imperiled animal species also occur in these communities, there are also significant concentrations in aquatic and bottomland systems.

The freshwater aquatic systems of the EGCP are among the most significant and at-risk aquatic biodiversity resources in North America, particularly for fish and mussel species. Each of these groups has unique





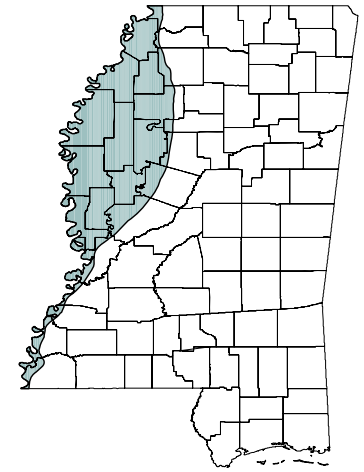
biodiversity resources. Many aquatic animals are endemic to the ecoregion, and many are restricted to a single river system and its tributaries. Thus, conservation of aquatic biodiversity in the EGCP requires conservation of most of the river systems. In addition, the EGCP supports a range of bottomland hardwood forests and cypress-gum swamps, as well as many lakes and natural ponds.

What is the current status of EGCP biodiversity? The pineland ecosystem (consisting of fire-maintained longleaf pine and slash pine woodlands and their associated seepage bogs and depression wetlands) once dominated a string of ecoregions from southeastern Virginia to eastern Texas. This system has now been reduced to less than five percent of its former range, making it one of the most endangered landscapes in North America. Not only have these pineland ecosystems been directly reduced in extent, but remaining areas are also fragmented and many suffer from the exclusion of fire, a critical ecological process for their maintenance and health. Aquatic systems have been severely affected by hydrologic alterations, pollution, and introduction of non-native species. Most of the hundreds of species endemic to the ecoregion, many of which were never common, have been further imperiled by these changes.

**The following natural and anthropogenic forest communities can be found in the EGCP ecoregion in Mississippi: Dry- Mesic Upland Forests/Woodlands, Pine Plantations, Old Fields/Young Hardwoods/Shrublands, Mesic Upland Forests, Wet Pine Savannas/Flatwoods, Spring Seeps, Bottomland Hardwood Forests, Riverfront Forests and Swamp Forests.**

### MISSISSIPPI RIVER ALLUVIAL PLAIN ECOREGION

The MSRAP is a 23,968,700 acre ecoregion that includes several uplands and most of the Atchafalaya Basin. Its most defining feature is the Mississippi River which flows south over the Mississippi Embayment, a structural trough in the earth's crust that, over the past one- to two-hundred million years, has thrust alternately upward and downward relative to the sea. MSRAP is a geologically complex area, with Coastal Plain sediments having been deposited by a retreating Gulf of Mexico during the Tertiary Period of the Cenozoic Era. The melting of the glaciers during the Pleistocene forced the upper Midwest and the current Ohio River Basin to drain southward and, over time, form the modern-day Mississippi River. Retreating glaciers left behind glacial outwash that, through time, was reworked by the energy of the river and overlaid by deep alluvium deposited through annual overbank flooding. Several distinct landforms in MSRAP represent an accumulation of coarse, glacial sediments that have not been fully subjected to the erosional forces of big river systems, and thus remain tens of feet above floodplain elevations. Well-drained, highly-erodible, wind-blown deposits (loess) originating from glacial outwash are characteristic of these landforms. Upland pine hardwood plant communities and, in areas of clay-pan formation, prairie communities, characterize these upland areas.



**Figure 8: Mississippi River Alluvial Plain Ecoregion in Mississippi**



The bottomland hardwood forest is by far the dominant natural plant component of MSRAP. It is maintained by regular back- and headwater flood events and localized ponding on poorly drained soils. Headwater or mainstem flooding results from rainstorms over the watersheds of the Mississippi's tributaries, and produces the great spring floods characteristic of MSRAP. Backwater flooding is a phenomenon in which high water stages on the Mississippi River create a damming effect, preventing tributary drainage into the mainstem and at times reversing tributary flow upstream. As a result, long-duration flooding accompanied by sediment and nutrient deposition occurs throughout the associated tributary watersheds.

Concomitant to these flooding mechanisms are the hydrogeomorphic processes associated with meandering river systems. The high energy inherent in the Mississippi River and its tributaries once sculpted the landscape, producing a surface geomorphology comprised of natural levees, meander scar (oxbow) lakes, point bars, and ridge and swale topography. Site conditions within MSRAP range from permanently flooded areas supporting only emergent or floating aquatic vegetation to high elevation sites that support climax hardwood forests. The distribution of bottomland hardwood communities within the floodplains of the Mississippi River and its tributaries is determined by timing, frequency and duration of flooding. Elevational differences of only a few inches result in great differences in soil saturation characteristics and thus the species of plants that grow there. As a result, much variability exists within a bottomland hardwood ecosystem, ranging from the baldcypress/tupelo swamp community that develops on frequently inundated sites with permanently saturated soils, to the cherrybark oak/pecan community found on the sites subjected to temporary flooding. Between

these rather distinct community types are the more transitional, less distinguishable overcup oak/water hickory, elm/ash/hackberry, and sweetgum/red oak communities.

In time, and in response to sediment texture, deposition rates and quantities, plant communities characteristic of MSRAP undergo ecological succession from pioneer communities dominated by black willow or cottonwood (depending on soil drainage characteristics) to red oak and finally white oak dominated climax community. But other disturbances also influence plant community distribution. Both human- and naturally-induced disturbances, such as ice storms, hurricanes, beaver activity, hydrologic alteration and silvicultural practices, greatly influence the rate and direction of succession. There is emerging thought that the dynamic nature of this water- and sediment-driven system, coupled with frequent disturbance, historically precluded, in most cases, the development or long-term viability of a closed canopy of senescent trees, or a community commonly thought of as old-growth. The pre-settlement forests of MSRAP were likely a shifting mosaic of even-aged small patches of all-ages, further defined by minute differences in elevation and tolerances among a large number of woody plants.

The diversity of forests and other habits characterizing the historic landscape provided an extraordinary habitat for a range of species utilizing MSRAP. River floodplain systems are highly productive and provide exceptional habitat for a variety of vertebrates including foraging and spawning fish, amphibians and reptiles. Over 240 fish species, 45 species of reptiles and amphibians, and 37 species of mussels depend on the river and floodplain system of MSRAP. In addition, 50 species of mammals and approximately 60 percent of all bird species in the



contiguous United States currently utilize the Mississippi River and its tributaries and/or their associated floodplains.

**The following forest community types can be found in the MSRAP ecoregion: Old Fields/Young Hardwoods/Shrublands, Bottomland Hardwood Forests, Riverfront Forests and Swamp Forests.**

### NORTHERN GULF OF MEXICO ECOREGION

The NGM ecoregion extends from Anclote Keys, Florida to the southern extent of the Laguna Madre de Temaulipas, Mexico. It is a rich and productive subtropical system that supports some of the most extensive wetland and seagrass habitats in the world. Much of the nearshore waters of the Gulf are divided into bay and estuarine systems behind barrier islands, which form a ring of sites around the NGM. For the purposes of this AON, maritime forests have been classified as part of the NGM ecoregion though they are found in the EGCP as well. These grade through salt marshes to productive estuaries.

TNC has divided the ecoregion into three broad subregions for planning purposes. Mississippi falls within the Central Gulf of Mexico region which runs from Galveston Bay, Texas to Mobile Bay, Alabama. This region is characterized by extremely high levels of riverine input.

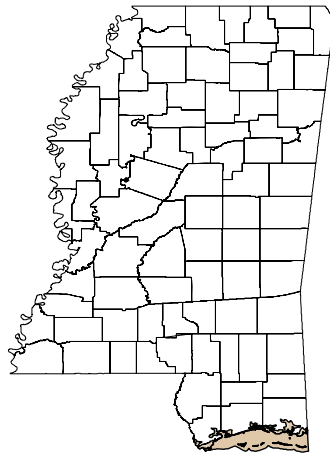


Figure 9: Northern Gulf of Mexico Ecoregion in Mississippi

Freshwater and sediments from the Mississippi River and to a lesser extent freshwater entering through Mobile Bay determine the characteristics of nearshore waters in this region. Coastal waters are generally variable in salinity, and water clarity is low because of the sediment load. Bottom sediments tend to be fine clays and muds. These conditions are ideal for the growth of marshes and oyster reefs.

The drainage basin for the Gulf extends from the Appalachians to the Rockies. It contains nearly 60 percent of the land area of the continental United States, including some the most fertile lands in the world. This productive drainage makes the Gulf one of the primary producers of finfish and shellfish in the United States. However, much of this land is in agricultural use, fertilizers, herbicides and pesticides which eventually threatens the productivity of the Gulf.

**One forest community type can be found in the NGM ecoregion: Maritime Woodlands.**

### UPPER EAST GULF PLAIN ECOREGION

The UEGCP ecoregion encompasses 33,861,051 acres and ranges from southern Illinois, western Kentucky and Tennessee, throughout much of Mississippi, east to Alabama and a limited area of Georgia and southeastern Louisiana.

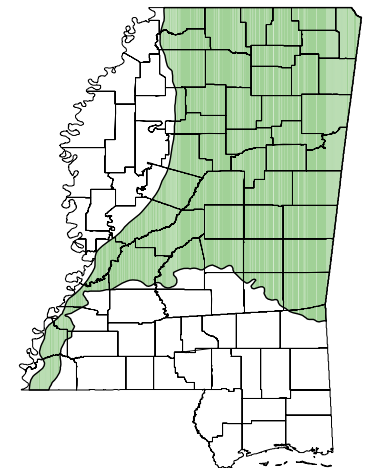


Figure 10: Upper East Gulf Coastal Plain Ecoregion in Mississippi





The region is bounded on the west by the MSRAP and on the north by the Ohio River, and Tennessee River. The eastern margin occurs at the contact point with older rocks of the Piedmont and Southern Ridge and Valley. This region has rugged terrain and hilly topography. In addition, the southern boundary approximates the range limits of major potential natural vegetation types: oak-hickory-pine to the north, and southern mixed hardwood forests to the south.

Coastal and fluvial processes have considerably reworked the land surface of the region. Approximately 70 million years ago, the area would have been around 4,000 foot elevation. However, the earth's crust sagged forming the Mississippi Embayment. During the Tertiary and Cretaceous periods the Embayment trough was repeatedly invaded by shallow seas leaving behind hundreds of meters of sediments that occupy broad bands approximately paralleling the Gulf of Mexico. The result is a region of belted character, in the form of inner lowlands and cuestas and other low-ridge landforms.

The upper Mississippi Embayment is underlain by an ancient, buried rift zone. This buried rift has acted as a "zone of weakness" in the continental crust and serves to localize earthquake activity in the central U.S. There have been many large magnitude earthquakes and abundant seismic activity in the region. The New Madrid earthquake (1811-1812) was among the strongest earthquakes in recorded United States history, resulting in up to nine feet of land subsidence in the upper part of the region. Further south, the geologic structure of the region has been affected by the presence of underground salt in the form of salt plugs, domes and basins. The Mississippi Interior Salt Basin, which extends

into this region, has extensive hydrocarbon reserves that are still largely undeveloped.

Throughout the region, soils are generally acidic with appreciable amounts of clay present. Ultisols, deeply leached and low in nutrients, are the dominant soil order. Alfisols, less weathered and greater in fertility, are present in more limited areas, especially associated with loess deposits (a unique type of windblown silt). Large quantities of loess were probably carried by wind from exposed sediments of the Mississippi River floodplain and deposited on adjacent uplands during the late Pleistocene and early Holocene. Loess eventually covered much of the underlying topography under a thick blanket thickest along the western edge and thinning abruptly eastward. Vertisols (soils with shrink-swell properties due, in part, to especially high clay content) are uncommon in the Southeastern Coastal Plain but are present in limited areas of the Black Belt where they were derived from marl and chalk residues.

The UEGCP overlaps several distinctive aquatic ecoregions. The majority of this region has been considered a priority for freshwater species conservation due to the richness of the fauna present. For example, rivers in this region provide habitat for over 206 native fish species. The region also supports relatively large numbers of crayfish and mussel species despite heavily disturbed conditions in many areas that have likely reduced faunal diversity. The bulk of the region's rivers, especially the Mississippi tributaries, have been channelized and/or subjected to heavy sedimentation.

The region includes a diverse assemblage of streams that vary in size, origin and geology. Particularly noteworthy rivers of this region include



the Hatchie, the longest free flowing tributary in the lower Mississippi River valley and tributaries of the Pascagoula, America's longest unencumbered river.

Natural vegetation of the UEGCP may be characterized as broad bands of different composition that roughly parallel the coast. From south to north these include southern mixed forests, oak-hickory-pine forests, and oak-hickory forests, interrupted by occasional southern floodplain forests and Black Belt Prairies. Southern mixed forests and oak-hickory-pine forests, the two predominant types in terms of area occupied, are recognized by the presence of longleaf pine and shortleaf pine. Although longleaf forests and woodlands were the dominant vegetation type of the Southeastern U.S. Coastal Plain, they occur in only limited areas of this region, extending landward into the UEGCP by only about 50 miles. Northward, longleaf pine is replaced by shortleaf pine.

Bluffs along the eastern edge of the Mississippi River, such as those around Vicksburg, are covered with up to 200 feet of loess. A number of factors account for the development and maintenance of precipitous cliffs and ravines where loess is deepest. The vegetation of these loess bluffs is often richer than surrounding areas due to the fertile topsoil and abundant moisture. In many cases, the bluffs provide habitat for plant species that are rare or absent from other parts of the Coastal Plain. In addition, the bluffs constituted a major refugium for mesophytic plant species, now generally more common to the north, during the last glaciation.

Blackland Prairies occur in two discrete areas of the ecoregion: the Jackson Prairie and the Black Belt – or Northeast Prairie. These areas are

among the distinct topographic regions in the state of Mississippi. At their closest point, 65 miles separate the formations supporting the two prairie types. The Black Belt (Northeast) is the larger of the two regions, stretching approximately 300 miles across Mississippi and into adjacent parts of central Alabama. This region, generally 25-30 miles wide, derives its name from the nearly black, rich topsoil that developed over Selma Chalk. Both areas have typically calcareous soils and were formerly occupied by natural grasslands and associated vegetation.

The broad forest cover composition also differs between parts of the region. While the percentage of total area occupied by deciduous forests is relatively evenly distributed across the region, mixed and evergreen forests (each generally including a component of pine species, are much less common overall in the Black Belt. The lack of evergreen forests in the Black Belt is complex, but is likely due to the poor suitability of the predominantly calcareous soils for pine growth.

The composition of the ecoregion's forests is also changing. Vast acreages of the region are being converted to pine plantations, in many cases at the expense of either existing deciduous or mixed forests, constituting one of the most consequential forestry developments in the region in the last four decades.

**The forest community types that can be found in the UEGCP ecoregion in Mississippi are: Dry-Mesic Upland Forests/ Woodlands, Pine Plantations, Old Fields/Young Hardwoods/ Shrublands, Mesic Upland Forests, Bottomland Hardwood Forests Riverfront Forests, Spring Seeps, Swamp Forests.**



**Table 2: Forest community types/subtypes in Mississippi by ecoregion.**  
Additional descriptions of forest community subtypes can be found in Appendix III.

FOREST COMMUNITY CODE	FOREST COMMUNITY TYPE/SUBTYPE	ECOREGIONS			
		NGM Northern Gulf of Mexico	EGCP East Gulf Coastal Plain	UEGCP Upper East Gulf Coastal Plain	MSRAP Mississippi River Alluvial Plain
<b>A</b>	<b>Dry-Mesic Upland Forests/Woodlands</b>		▲	▲	
A.1	Dry Hardwood Forests		▲	▲	
A.2	Dry Longleaf Pine Forests		▲	▲	
A.3	Dry-Mesic Hardwood Forests		▲	▲	
A.4	Dry-Mesic Shortleaf/Loblolly Pine Forests		▲	▲	
<b>B</b>	<b>Old Fields, Prairies, Cedar Glades and Pine Plantations</b>		▲	▲	▲
B.1	Northeast Prairie/Cedar Glades			▲	
B.2	Pine Plantations		▲	▲	
B.3	Old Fields and Young Hardwoods (Shrublands)		▲	▲	▲
<b>C</b>	<b>Mesic Upland Forests</b>		▲	▲	
C.1	Beech/Magnolia Forests		▲	▲	
C.2	Mesic Longleaf Pine Savanna/Forests		▲	▲	
C.3	Loess Hardwood Forests		▲	▲	
C.4	Lower Slope/High Terrace Hardwood Forests		▲	▲	
D.1	Bottomland Hardwood Forests		▲	▲	▲
<b>E</b>	<b>Riverfront Forests</b>		▲	▲	▲
E.1	Cottonwood/Black Willow/River Birch Woodlands		▲	▲	▲
<b>F</b>	<b>Wet Pine Savannas/Flatwoods</b>		▲		
F.1	Wet Pine Savannas		▲		
F.2	Slash Pine Flatwoods		▲		
<b>G</b>	<b>Spring Seeps</b>		▲	▲	
G.1	Hardwood Seeps		▲	▲	
G.2	Pine Seeps		▲	▲	
<b>H</b>	<b>Swamp Forests</b>		▲	▲	▲
H.1	Bald Cypress/Gum Swamp Forests		▲	▲	▲
H.2	Small Stream Swamp Forests		▲	▲	
<b>I</b>	<b>Upland Maritime and Estuarine Fringe Habitats</b>	▲			
I.1	Maritime Woodlands	▲			





## MISSISSIPPI'S CLIMATE

Mississippi has a humid, subtropical climate though microclimatic factors vary from place to place within the state. Although temperatures vary locally, statewide average summer temperatures average about 80° F. Average daily temperature is approximately 43.2° F in winter. The annual average rainfall is 52.86 inches per year and is well distributed throughout the year.

## SOILS

Diverse soil parent materials and topography give rise to great soil diversity in Mississippi. Soil parent materials range in age from Cretaceous (oldest) in the northeastern part of the state to recent Holocene (youngest) in the delta region. Soils in Mississippi have developed from marine, alluvial and wind-blown sediments. Elevations range from sea level in the coastal counties to 806 feet at Woodall Mountain in Tishomingo County. Eight of the 12 soil orders (broad soil groups) recognized in the United States occur in Mississippi.

Figure 11: Mississippi Soils



Mississippi soils are well suited for the production of timber and forests products. Forty-two percent of the commercial forestland in Mississippi is capable of producing over 120 cubic feet of wood volume per acre annually. Another 40 percent is capable of producing over 85 cubic feet per acre per year compared to 23 percent of commercial forestland nationwide.

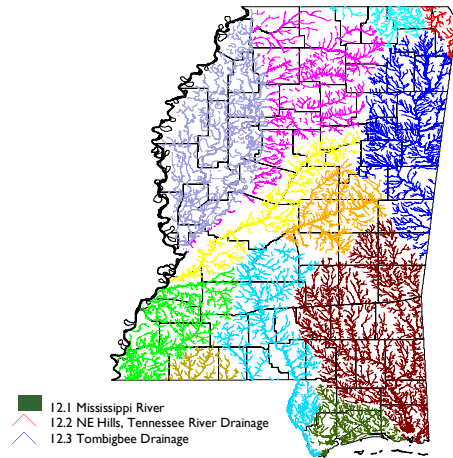
## STREAMS AND WATERSHEDS

Mississippi has about 14,000 miles and 350,000 acres of perennial streams in the following 13 major drainages or watersheds.

- ◆ Mississippi River
- ◆ Northeast Hills, Tennessee River Drainage
- ◆ Tombigbee Drainage
- ◆ Lower Mississippi North Drainage (LMND) Hatchie and Wolf Systems
- ◆ Upper Coastal Plain, Yazoo Drainage
- ◆ Big Black River Drainage
- ◆ Upper Coastal Plain, Pearl River Drainage
- ◆ Mississippi Alluvial Plain (MAP)
- ◆ Lower Coastal Plain, Pearl Drainage
- ◆ Pascagoula Drainage
- ◆ Coastal Rivers Drainage
- ◆ Lake Ponchartrain Drainage
- ◆ Lower Mississippi South Drainage



Channel size influences community structure in and around a stream. A wide diversity of mussels, fishes, amphibians and reptiles require lotic (flowing water) habitats for their survival. Stream riparian zones support some of the most dynamic wildlife assemblages compared to any other habitat. Healthy riparian zones also help stabilize stream banks and provide organic input and woody structure into stream channels.



**Figure 12: Major Stream Drainages of Mississippi.**  
*Source, MDWFP*

Streams throughout Mississippi have been subjected to a wide array of alterations. Stream channels have been widened, deepened, and desnagged and straightened through channelization projects for flood control. This has resulted in shortening of streams, increases in stream gradient, and loss of habitat for animals both in and near the streams. Levees now prevent many streams and rivers from spreading over floodplains. Dams have been placed on numerous streams for flood control, water supply for municipalities and industry, navigation and recreation. These dams restrict movement of animals and alter hydrologic characteristics of the rivers on which they are built. The major tributaries of the upper Yazoo River (Coldwater, Tallahatchie, Yocona, and Yalobusha) have flood control dams. The Pearl River system is now divided by Ross Barnett Dam which effectively restricts

passage of fishes upstream from the dam. Construction of the Tennessee-Tombigbee Waterway created an unnatural connection between two separate drainages, and completely altered the Tombigbee drainage. The Tombigbee River is now a series of navigation pools impounded by multiple locks and dams, which bears little resemblance to the original Tombigbee River. The only portion of the Tennessee River which borders Mississippi in the northeast corner, is impounded by Pickwick Dam. Numerous smaller weirs and lowhead dams exist on streams throughout the state.

Land use practices in forestry and agriculture have resulted in vast increases in sediment deposition in streams as well as increasing erosion. Headcutting, which can be caused by stream channel alteration, has resulted in long stretches of stream erosion and bank destabilization which move progressively upstream. Many streams throughout the state show the effects of headcutting. Most of these streams have broad, shallow channels with unstable substrate and little or no canopy cover. Drainage of wetlands and removal of groundwater for irrigation has caused a drop in the water table in some areas, especially in the delta region. This has created extremely low flow conditions in streams during dry periods. Streams have been receptacles for sewage, industrial waste, and agricultural runoff. The Mississippi Department of Environmental Quality lists many factors that affect water quality in streams, including organic enrichment, pesticide contamination, sedimentation and siltation, nutrient enrichment, mercury contamination and pathogens.

Forests, wetlands, riparian zones and grasslands are considered to be fundamental to a sustainable clean water supply.



## RECREATIONAL OPPORTUNITIES AND AESTHETICS

Because of its abundance of forests, streams, lakes, coastal waters and marshes, Mississippi is a popular destination for Mississippians and non-residents seeking outdoor recreation opportunities. Tourism, wildlife associated and forest-based recreation constitute a substantial segment of Mississippi's economy. According to the *National Survey of Fishing, Hunting and Wildlife-Associated Recreation* report over one million U.S. residents age 16 and above participated in wildlife recreation in 2001 and spent \$974 million on wildlife recreation.

The state has nine national wildlife refuges, six national forests, seven national parks, 24 state parks, and 42 state wildlife management areas, one national estuarine research reserve, 83,000 acres of coastal preserves and thousands of acres of lands managed by the U.S. Army Corps of Engineers that support and serve the growing tourism and recreation industry. Although not all revenues reported for tourism and recreation are the result of forest-based activities, the natural beauty of Mississippi's forests, combined with the state's diverse topography, make it an increasingly popular vacation destination. The most popular forest-based outdoor recreation activities include hunting and fishing, hiking, horseback riding wildlife observation, photography, camping and enjoyment of nature.

Most forest industries that own land in Mississippi recognize the opportunity for outdoor recreation on their lands and some make them available for hunting, hiking, and other public recreation use by lease or permit. Recreational use on non-industrial, private forestlands is much more limited than on public lands. Fewer landowners are willing to allow

the public access to their lands, and an increasing number lease their lands, primarily for hunting, to users who also help protect forest resources.

Often overlooked as a benefit, the aesthetics forests provide play an important role in the economic and social well-being of Mississippi. The beauty and serenity of public and private forestlands have a positive impact on tourism and economic development. Forests adjacent to urban areas and communities can result in increased property values. They soften the glare and hard lines of developed areas, reduce noise and pollution and act as sound barriers or screens.

## CULTURAL HERITAGE

Mississippi's forests and other natural resources supported a great variety of tribes the heaviest Native American population of the Southeastern states. The Chickasaws, Choctaws and Natchez tribes were dominant, but many smaller tribes existed throughout the state.

When Europeans first settled Mississippi, Native Americans had inhabited the area for as long as 12,000 years. These peoples developed permanent settlements, practiced agriculture, hunted and fished in virtually every portion of the state. The Mississippian culture (700-1300 AD) featured ceremonial mounds, ornate pottery, and sophisticated agriculture. Archaeological sites are numerous, especially in river valleys and adjacent floodplains.

Hernando DeSoto became the first European to explore Mississippi in 1540, but the Spanish abandoned the area in 1542. In 1699, Pierre Le Moyne established the first permanent French settlement in the lower





Mississippi Valley at Fort Marepaus, near Ocean Springs. The French migrated to the area which was part of the Louisiana Territory and by 1731 had annihilated the Natchez tribe. Later the British occupied the area, then the Spanish military. Mississippi was granted statehood in 1817.

By the early 1800s, "Indian" cessions and removal campaigns opened up to white settlement large portions of central and southern (Choctaw) and northern (Chickasaw) Mississippi. As the native people were removed, white settlement proceeded rapidly. Today Mississippi has numerous historic sites that include Native American sites and Indian burial mounds, antebellum homes and plantations and civil war battlegrounds and cemeteries.

Although many of the more important and obvious archaeological and historical sites have been protected and restored, many little known and undiscovered sites, including some that lie within forestlands and along riparian corridors, remain unprotected and unexplored. Responsibility for conservation of historical and archaeological resources rests with the Mississippi Department of History and Archives.

## MINERAL RESOURCES

Mississippi is not one of the nation's leading mineral producing states. Nevertheless, a considerable number of commercially valuable minerals have been found and developed. Petroleum, natural gas, sand, gravel, clay, crushed stone, shell and brown coal represent the majority of mineral resources produced in the state. Although regulations have been strengthened in recent years, surface mining destroys native forests, threatens water quality in streams and adversely affects natural landscapes in Mississippi.

Subsurface minerals rights are often severed from surface rights on private lands in Mississippi. For the purposes of the FLP, ownership of mineral rights by another party should be considered on a case-by-case basis.

## TIMBER MANAGEMENT OPPORTUNITIES

The economic importance of Mississippi's timber industry and the increasing demand for forest products is a major component in the "working forests" concept – a concept that encompasses all benefits and values healthy forests provide including forest products as well as cultural, social and economic value, ecological and watershed values discussed in this section. At 2.9 million people, Mississippi's population is placing greater demands on our remaining forestlands and the resources they provide. The state's forest industry provides a vital source of income and jobs for many rural areas and smaller cities. Timber is the dominant crop harvested the majority (65 to 70) of the state's 82 counties. Harvesting, processing and marketing of wood products accounts for over 52,580 jobs.

A recent (pre-Hurricane Katrina) *Harvest of Forest Products* report from Mississippi State University Cooperative Extension Service illustrates the economic value of timber in the state:

*Mississippi's forest industry (including private landowners, independent harvesters and forest industry) harvested and delivered \$1.25 billion worth of forest products to mills and other processors in 2004. The total value of Mississippi's 2004 timber harvest delivered to the first point of processing (such as a pulpwood yard or sawmill) was \$1,254,202,873. This harvest value is 14.5 percent higher than 2003. The year 2004 was the twelfth straight year Mississippi's timber production value was over \$1 billion. Timber was the second most valuable agricultural commodity in 2004.*



*Mississippi's timber harvest value increased in 2004 for the second consecutive year. Volumes for all sawlog categories were higher and pulpwood volumes were lower in 2004. Delivered prices were higher for all products. Delivered prices for pine sawlogs in north Mississippi and pulpwood in all areas of the state experienced double-digit increases.*

*A record-setting U.S. softwood lumber demand and an expanding economy in 2004 helped to reverse the trend in previous years. A persistently strong U.S. housing market fueled the pine lumber market and the southeast U.S. continued as the most active housing construction region. Pine lumber production moved ahead in 2004 to record levels. Southern pine lumber production region-wide for the year 2004 was a new record 18.1 billion board feet. Since pine sawlogs account for 62.5 percent of Mississippi's timber harvest value, this market helps steady the state's timber value performance in 2004.*

*Hardwood sawlog markets continued to improve in 2004. For the year, Mississippi hardwood log harvest volume was about 3% higher and delivered log prices improved about 7%.*

*Mississippi's pulpwood economy continued to adjust in 2004. Pulpwood harvest volumes decreased in 2004 but prices improved as the paper industry rebounded. Standing pulpwood prices increased in almost all areas of the state. Delivered prices all increased more than 10 percent for the second year in a row but pulpwood prices are well below historical highs in 1999. Pine pulpwood value increased 8 percent and hardwood pulpwood value jumped 15 percent. Overall, pine and hardwood pulpwood accounted for about 23.4 percent of the harvest value.*

*Mississippi's forest economy continues to change. Increasingly forest industry forestlands are being sold to investor groups. In 2004, International Paper Company became the latest forest products firm to announce their intentions to sell their timberland holdings. The state's economy continues to be excessively concentrated on pine sawlog products. Since over 62 percent of the state's forest harvest value is dependent on pine sawtimber the forest economy is less balanced than it was 10 years ago. Economic development officials would do well to*

*concentrate on economic development efforts to attract companies that use hardwood logs and pulpwood-size pine timber.*

*In spite of these changes Mississippi forest landowners remain in good position to supply domestic and international forest products demand. The long-term outlook for Mississippi timber production, especially for pine, remains positive.*

Over the past five years, forest regeneration averaged 247,442 acres per year and 66 percent of that was on private, non-industrial land. Fifty-eight percent of regeneration on private lands during that time was aided by state and federal assistance such as the Conservation Reserve Program, Forest Incentives Program, the Forest Resource Development Program and others (discussed in Chapter Four).

The USDA Natural Resource Conservation Service (NRCS) Natural Resource Inventory (NRI) identified a 5.8 percent increase of Mississippi forestland from 15,319,000 acres in 1982 to 16,208,000 acres in 1997. The major cause of timberland increase was conversion to from agricultural lands to primarily pine lands which is influenced by national farm land programs' emphasis on Mississippi.

However, losses of forest land acreage near urban areas in the state such as the Gulf coast counties, the Jackson metropolitan area, Desoto County/Memphis area are conspicuous and more closely reflect the Southeastern trend of conversion of forest to non-forest use in urban and developed areas.

Forestlands controlled by federal and state agencies and forest industries are generally well protected by laws, regulations, company policies and prudent management. Federally owned lands in Mississippi include the Bienville, Chickasawhay, Desoto, Homochitto, Delta, Holly Springs and



**Table 3: Change in rural land use in Mississippi 1982-1997. \***Source: USDA NRCS, *NRI*

	1982	1987	1992	1997
<b>Cropland</b>	7,416	6,665	5,726.2	5,352.4
<b>CRP Land</b>	0	291.9	778.1	798.8
<b>Pastureland</b>	3,989.3	3,890.7	3,932.1	3,679.3
<b>Rangeland</b>	0	0	0	0
<b>Forest Land</b>	15,319	15,694.3	15,915.8	16,208.8
<b>Other Rural Land</b>	327.7	327.4	325.8	389.3
<b>Total Rural Land</b>	27,052	26,869.3	26,678	26,428.6

\*Data per 1,000 acres

Tombigbee national forests, Tennessee Valley Authority (TVA) and U.S. Army Corps of Engineers reservoir and waterway properties, the Natchez Trace, the Vicksburg Military Park and Gulf Islands National Seashore and several national wildlife refuges. Numerous state parks and state wildlife management managed by MDWFP comprise the bulk of state-owned forestland under protection. But public forestlands of Mississippi also include Sixteenth Section forests established in the 1830s "for the support of public education". There are a total of 673,106 acres in sixteenth sections statewide and most are classified as forest lands. They are managed by the Board of Education with assistance from MFC for the purpose of providing funds to support local schools. The lands may also be leased to private contractors for fair market value. According MFC, there are 438,118 acres of forest on sixteenth section lands in Mississippi.

In recent years numerous partnerships have developed between and among federal and state agencies and forest industries that contribute substantially to the effective protection and sound management of the properties they control. These inter-organizational agreements provide

protection and management of public and forest industry lands for fire management, wildlife management, threatened and endangered species protection, recreation services, etc.

It is often on non-industrial, private lands that protection and planned management of resources is lacking and where the greatest threat of fragmentation of forestlands, parcelization, conversion to non-forest uses, and danger from abuse and destruction of forest resources exists.

While technical assistance and limited financial assistance are generally available to private landowners from the Mississippi Forestry Commission (MFC), USDA NRCS and Farm Services Agency (FSA), other government agencies, private forestry consultants, government organizations (NGOs), universities and cooperative extension services, and forest industries, most forest landowners still have no established plan or policy for managing their forestlands. Many do not consider a plan or management until they decide to harvest timber. Many others wait until after the timber is harvested to consider options for the future productivity of their lands. The current level of technical assistance and incentives is considered inadequate to serve the large number of forest landowners in the state.



THIS PAGE LEFT  
BLANK INTENTIONALLY.



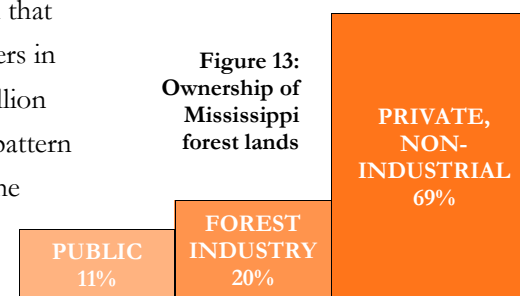




## CHAPTER 2: FOREST OWNERSHIP

### LAND TENURE

Who owns Mississippi's lands? Most (69 percent) is owned by the private, non-industrial forest landowner. Forest industry owns 20 percent and the remainder (11 percent) is in public ownership. According to a 1996 inventory of private landowners conducted by Mississippi State University, it is estimated that 341,000 private landowners in the state own over 13 million acres. This is the typical pattern for forest ownership in the southern U.S.



### CHARACTERISTICS OF THE "TYPICAL SOUTHERN LANDOWNER"

The South had an estimated 4.9 million forest landowners in 1994. That was a 28 percent increase in the number of owners since 1978. More than half own less than 10 acres. Most are private, individual owners and the top three groups are white-collar workers, retirees and blue-collar workers, respectively. Taken together these groups comprise 72 percent of the South's private forest owners and own 45 percent of the forestland. Individuals 55-years-old or older own 47 percent of the forestland in the South.



The primary reason for owners acquiring and holding forestland varies with tract size and other factors. Small landowners tend to own forestland for amenity values (residence, enjoyment), but larger landowners place greater value on timber production. Most Mississippi forestland owners do not have assistance from a forestry professional nor have they been involved in forestry-related educational programs.

### FOREST OWNERSHIP TRENDS

Trends in forest ownership in Mississippi and the South have changed through the past century. Major trends can be summarized as follows:

- ◆ **1850-1920:** Acquisition of lands by railroads
- ◆ **1920-40:** Acquisition of marginal private lands by federal government (USDA Forest Service)
- ◆ **1930-70:** Acquisition of private lands by paper and other forest products companies
- ◆ **1990-Current:** Sale of long-held corporate lands to investors, pension funds, etc.

Within the non-industrial, private ownership category, the *1999 Forest Inventory* revealed a significant (1.56 million acre) increase in the private individual class, which is the largest class of forestland owners in the state, from 1989 to 1999. As such, these individuals will continue to have a major influence on the future use and condition of the state's forest resources.

Notably, the fragmenting of larger forested tracts into smaller parcels is increasing in the South. Development of forestland for other uses and

dividing family ownerships among heirs are contributing factors. These changes could have important impacts on timber and habitat production in the coming years and should be a major consideration in evaluating potential Forest Legacy parcels in the state.





## CHAPTER 3: TRENDS AND THREATS TO FOREST RESOURCES IN MISSISSIPPI

Many emerging factors in private forest ownership are affecting forests at the local, state and national level. The three most important and interacting changes affecting private forests in the South are: 1) land development fueled by economic and population growth; 2) new patterns of growth that place higher populations in the vicinity of forests; and 3) restructuring of the forest products industry, which has long held many of the largest tracts of contiguous forests in the region. These three dynamics will determine the future extent and fragmentation of the South's forests.

Below is a discussion of trends in fragmentation of ownerships and the aging of individual owners, restructuring of the forest industry and the rise of financial owners, cover type conversion and sprawling development.

### FRAGMENTATION OF OWNERSHIPS

Fragmentation of forest ownerships, also called subparcelization, may be caused by a number of factors, including the distribution of parcels to heirs following the deaths of owners, pressure by developers to sell for development or pressure to sell to avoid higher property taxes. Many of these smaller tracts that remain forestland will become part-time farms, second home sites and outdoor recreation retreats in the future. While still counted statistically as forest, these areas often become essentially residential and can no longer be considered functioning forest ecosystems. The more urbanized the forest, the less it is capable of functioning as wildlife habitat or as a source of forest products. Even



though there may appear to be no net loss in forested area in the state, the ecological services provided by forests in smaller parcels may be substantially reduced. Forest amenities threatened by subparcelization include threatened and endangered species and other species of concern, water quality and watershed values, scenic beauty and wildlife habitats.

In the absence of new zoning laws (unlikely in Mississippi in the near future) or attractive incentives, fragmentation of forestland tracts will continue due to increasing population, pressures to subdivide tracts and owners' desire to live in the rural/urban interface.

### THE RISE OF FINANCIAL OWNERS – TIMOS AND REITS

The 1990s saw acceleration in industry consolidation and turnover in industrial forestland. A wave of mergers has swept the industry in recent years. The sale of forestland can be traced to the rapid consolidation of the wood products sector since the late 1990s. To service the debt resulting from these acquisitions, buyers have liquidated low-return assets, especially timberlands. While holding timberland was once viewed as a necessary safety net against interruptions in the flow of raw materials, timber supply from other owners is now viewed as reliable and plentiful and as a result, owning forests is no longer considered essential for the industry.

In the course of selling off forestlands that are no longer strategically important to own directly, portions of these properties have gone into residential uses. International Paper, for example, is actively selling much of its holdings in Mississippi.

### THE RISE OF FINANCIAL OWNERS – TIMBER INVESTMENT MANAGEMENT ORGANIZATIONS

Many industry lands are being purchased as a financial asset by Timber Investment Management Organizations or TIMOs. TIMOs do not own land outright, but rather act as intermediaries, acquiring and managing forests for investors that range from individuals to pension funds. With growing investments by pension funds, it is likely that financial ownership of Mississippi's private forests will continue to accelerate. The indirect nature of financial ownership tends to centralize management control with financial managers, not foresters. Because investment managers are evaluated by their ability to achieve certain levels of return, there is no reason to expect financial owners to have longer-term forest management perspectives than those of forest products companies. Also, investments are often structured as closed-end funds, with forest parcels bundled to form an investment fund with a fixed term. At the end of the term, the assets of the fund (forest parcels) must be sold and the returns distributed to the investors. By definition, the land must be sold, likely to another group of investors with some portion possibly sold for development. The way these investments work can lead to forest fragmentation and raises questions about forest sustainability.

Another trend is the Real Estate Investment Trust or REIT - a tax designation for a corporation investing in real estate that reduces corporate taxes. Their structure allows for investment in real estate (timber) similar to mutual funds which provide for investment in stocks.

### COVER TYPE CONVERSION

One type of forest conversion is the replacement of one forest type with





another through management or other human influences. For example, forests dominated by pines can be converted to hardwoods by selective cutting and the exclusion of fire. Natural stands can be converted to plantations. As stated in the USDA Forest Service's 2000 *Renewable Resources Planning Act Assessment of Area Change*, "Over the past 50 years, the largest changes in the private forests of the United States have been the substantial decrease in the area of natural pine and the rapid increase in the area of planted pine in the South." When cover type conversion is a result of poor forest management, reduced forest health and/or productivity can then lead to subsequent conversion to other non-forest uses.

Some forested ecosystems of Mississippi and the Southeast have been recently highlighted as being in peril of complete or near-complete loss. Reed Noss and Robert L. Peters identified in *Endangered Ecosystems of the United States: A Preliminary Assessment of Loss and Degradation* what they felt were the most endangered ecosystems in North America based on four factors:

1. Dramatic diminishment in area since European settlement
2. Small and fragmented current area
3. Relatively high numbers of imperiled species
4. Continuing threats to these species' existence

Noss and Peters identified four Mississippi ecosystems that are endangered:

1. Longleaf pine forests and savanna (critically imperiled)
2. Blackbelt and Jackson Prairies (critically imperiled)

3. Streams in the Mississippi Alluvial Plain (critically imperiled)
4. Riparian Forests (threatened)

Longleaf pine forests and savannas, streams and riparian forests should be considered priorities for FLP in areas of Mississippi subject to large population growth.

### SPRAWLING DEVELOPMENT/ POPULATION GROWTH

This pattern of ownership, combined with activities associated with increased numbers of people in close proximity to forestlands, often creates problems sometimes referred to as "rural/urban interface" problems. The rural/urban interface is a generalized area, often on the fringe of an urban area, where people establish residence. Forestland in the vicinity of major urban centers and larger towns is more likely to be affected.

Such areas are characterized by the intermingling of home sites with forest and agricultural lands and the activities associated with each land use. Special problems encountered in the rural/urban interface include increased risk of forest and structural fires, problems with smoke generated by prescribed fires, and stresses imposed on forests and the environment caused by increased numbers of people in close proximity to forestlands.

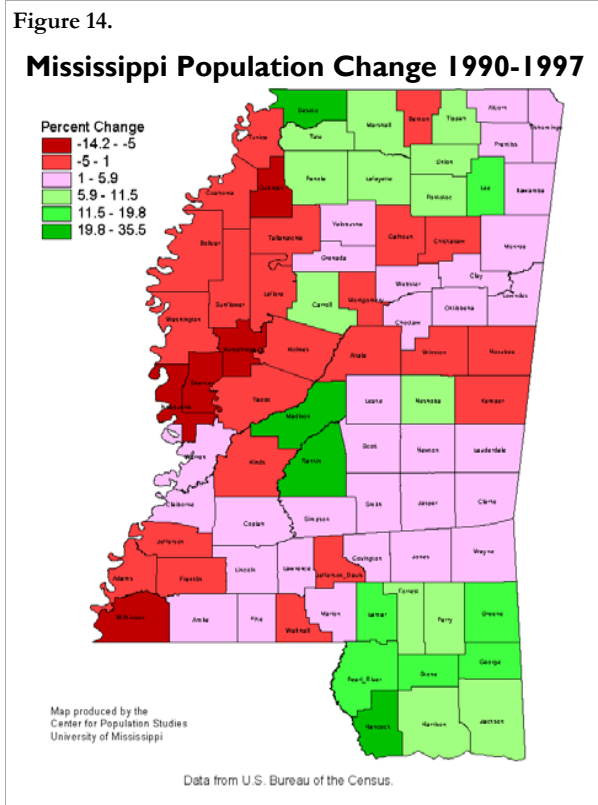
Population and population growth are two of the more important factors that determine the health of forestlands and the areas most likely to be impacted by sprawling development. Mississippi's population increased by more than 13 percent from 1990 to 2005 to 2,921,088 million people, and is projected by the U.S. Census Bureau to increase by another



3,092,410 percent by 2030. The following two tables indicate population changes in the last decade (Figure 14) and current population density by county (Figure 15).

In a study of the five counties surrounding Charlottesville, Virginia, researchers found that as the density of population increased, the probability of the forest functioning as timberland decreased. At 45 people per square mile (psm), the chance was 50 percent; at 70 psm it was 25 percent; and at 150 psm the probability was zero.

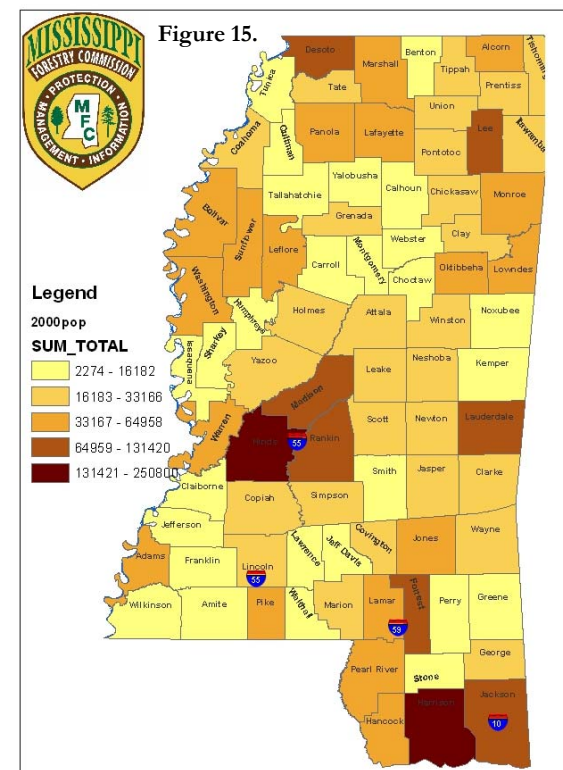
There are several counties in Mississippi where psm exceeds 150 such as Harrison County (326 psm), Jackson County (180 psm), Hinds County (288 psm) and Lee County (168 psm). All are in recommended FLAs for Mississippi.



The most rapid population growth can be expected to occur near major urban areas, along major transportation corridors, and in the vicinity of large industrial plants such as the Nissan automobile plant at Canton, located about 15 miles north of Jackson and the Toyota plant in Lee County. Growth is expected to be heaviest around

Jackson, Desoto County/Memphis area and from Hattiesburg south to the Gulf coast (post Hurricane Katrina).

Development of utilities and services follows increases in population growth, and the presence of this infrastructure often stimulates further growth. Sprawling development profoundly affects land use, irreversibly breaking up and replacing forests, agricultural lands, and wild lands with roads, utility corridors, reservoirs, houses, schools and commercial



**Mississippi Population Density by County**



development. Such physical fragmentation of forestlands can severely reduce biological diversity and sustainable production of wildlife by creating forest areas of insufficient size to support diverse ecological communities or resulting in areas that lack one or more essential ecosystem elements. Fragmentation may also eliminate or degrade corridors that connect ecologically important forested areas and increase wildlife/human conflicts.

### PROJECTED CHANGES IN FORESTS

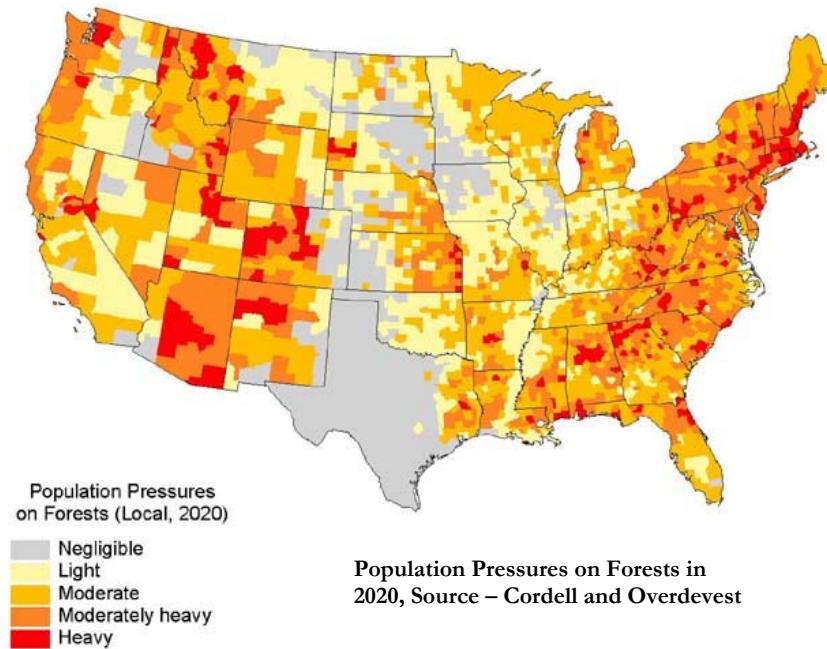
In 2010, the total area of forestland in the state is likely to be about the same. In the short run, forest land losses to development and other uses may be partially offset by reversion of agricultural lands to forestland and by reforestation of marginal and sub-marginal agricultural lands with the aid of government programs.

The USDA Forest Service  
Recreation, Wilderness, Urban

Forest, and Demographic Trends Research Group has produced national “hotspot” maps representing counties that have forest cover but also have current or projected (to 2020) population growth pressures (Figure 16). They examined the spatial overlapping of low-to-high levels of human presence and activity with low-to-high levels of remaining forest and natural land area. They refer to locations where high levels of

human pressure coexist with high levels of forest and natural lands as “hotspots”. These are places where natural lands are still in relative abundance *and* where human population growth and demands also are highest. Details may be found in the publication, *Footprints on the Land: An Assessment of Demographic Trends and the Future of Natural Resources in the United States*.

Figure 16:



Environmental and conservation organizations are expected to seek more legislation, programs and regulations that affect the management of public lands.

Changes would be aimed at protecting biological diversity, water quality, cultural resources, wildlife habitats, and scenic values and increasing outdoor recreational opportunities. Timber production on public lands is likely to be de-emphasized.

New laws and regulations affecting privately owned lands may be

sought, but are likely to be adopted at a much slower rate than on public lands. Emphasis for private lands protection will be aimed primarily at protecting water quality and regulating forest practices, especially logging activities. Voluntary incentive-based programs will likely continue as a primary way to improve forest health.



It is important to recognize that while sampling data indicates stability or even a net increase in total forestland in many counties over the past few decades, these gains are in most cases due to a smaller area being converted *from* forestland than the area of abandoned cropland or pasture being converted *to* forestland by active replanting or by natural regeneration of land. The overall character of the forest itself can change significantly, since the forests lost to other uses often differ considerably in age, composition, quality, and ecological value than the forests gained. For example, while pine plantations on former agricultural land are generally considered “forest,” they obviously lack certain ecological, economic, and recreational values of natural stands.

### PUBLIC CONCERN

In recent years, the public has become much more focused with respect to environmental concerns and more aware and outspoken about local issues. Urban dwellers seek more outdoor recreation experiences and forested greenspaces and exert increasing user pressure on private as well as public lands. As a result, sentiment and support for environmental protection on all lands, and public lands in particular, by environmental and conservation organizations, as well as individual citizens, are growing and are expected to increase.

Programs such Forest Legacy can in some small way aid in stemming forest loss, fragmentation and ownership changes in the South and Mississippi. Decision-makers must recognize that fragmentation of the remaining large blocks of forest ownership will probably come as a one-time and irreversible event, and opportunities for protecting values in contiguous forests will shrink substantially in the next few years. Industry

land sales provide a unique opportunity for conservation interests to partner with TIMOs to protect ecosystem benefits.







## CHAPTER 4: EXISTING CONSERVATION PROGRAMS FOR FOREST RESOURCES IN MISSISSIPPI

A wide array of land conservation tools are available in Mississippi for private lands. Most do not focus exclusively on forestland, but most do have a major emphasis on conservation through restoration, protection or enhancement of forest communities. The following is a description of the major state, federal and non-government programs that exist at the time of the development of this *Assessment of Need* followed by an overview of the Mississippi laws regarding forest land protection and tax incentives for private landowners. Many of these programs have the potential to complement Mississippi's Forest Legacy Program (FLP).

### STATE AND FEDERAL PROGRAMS FOR PRIVATE LANDOWNERS

Several state and federal programs have been developed to provide incentives and technical assistance to landowners to encourage reforestation, protection and management of existing forests and to discourage conversion of forest land to other uses. The following is a list of most state and federal programs that provide assistance to forest landowners. Many of these programs will enhance and support the FLP in Mississippi.

The **Mississippi Forest Stewardship Program (FSP)** was created in the 1990 Farm Bill to help private non-industrial forest landowners more actively manage their forestland, to maintain these lands in a productive and healthy condition for the future and to increase the economic and environmental benefit of these lands. Funded through USDA Forest Service and administered by the MFC this voluntary program provides



technical assistance to landowners that have a minimum of ten acres, an approved ten-year multiple resource management plan, specific objectives for management and demonstrate that he or she is a good steward. Its sister program, the **Forest Land Enhancement Program (FLEP)**, provides financial assistance and incentives to landowners to implement aspects of their Forest Stewardship Plan. Every FLP tract in Mississippi must have a Forest Stewardship Plan or multiple resource plan.

**Forest Resource Development Program (FRDP)** also administered through MFC provides financial assistance to eligible landowners for establishing and improving a crop of trees. This program helps offset a landowner's expense by sharing the cost of implementing specific forestry practices designed to produce timber and enhance wildlife development.

In turn, a landowner agrees to protect the area receiving FRDP assistance from fire and grazing and to properly manage the area for a minimum of ten years. Some FRDP tracts may be eligible for FLP.



**North American Wetland Conservation Act Grants (NAWCA)** provide matching funds through the USFWS to organizations and individuals who have developed partnerships to carry out wetlands conservation projects for the long-term benefit of wetland-associated migratory birds and other wildlife on both private and public lands. There is a Standard and a Small Grants Program. Cost-share is 50 percent. Nine projects have been funded in Mississippi under the

Standards Grants Program. The most recent project underway involves enhancement of over 1,000 acres of forested wetlands and improved management of 243 acres of moist soil units in Malmaison Wildlife Management Area (WMA). NAWCA funds may be used to target restoration of forested wetlands on FLP tracts or adjacent to FLP tracts.

The **Landowner Incentive Program (LIP)** is a new initiative funded by the USFWS and coordinated by the MDWFP in conjunction with the non-profit conservation organization, Wildlife Mississippi, using federal funds to enhance, restore and protect imperiled habitats and benefit at-risk wildlife on private lands. Priorities in Mississippi are longleaf pine ecosystems in the southeast part of the state, blackland prairie in the northeast and central sections and bottomland hardwoods in the delta. LIP will confer funds to landowners in these priority areas to cost-share practices such as site preparation, prescribed burning, tree and native warm season grass plantings and herbicide applications. Biologists provide technical guidance to all interested landowners and projects are reviewed and ranked by a team to determine eligibility. Longleaf pine ecosystems are a target for LIP and FLP. Some LIP tracts may also be FLP candidates.

The **Mississippi Scenic Streams Stewardship Program (SSSP)** was established in 1999 by the Mississippi Legislature to encourage voluntary private conservation efforts by riparian (streamside) landowners. Once a public waterway in Mississippi is designated by legislative action as scenic, MDWFP as the lead agency through its Mississippi Museum of Natural Science (MMNS) and its Advisory Council, develop a cooperative, voluntary stewardship plan for the stream. Individual landowner agreements can provide a connected patchwork of protected stream



banks along the length of a stream. The goal is to maintain good water quality for recreation and fish and wildlife habitat. Achievement of the goal is through use of Forestry Best Management Practices (BMPs) which are water quality improvement practices that will maintain the health of streams by keeping stream banks in good condition and preventing harmful sedimentation. In 2003, the Legislature enacted a law to allow a Mississippi income **tax credit** on 50 percent of allowable transaction costs (appraisals, baseline surveys, engineering and surveying fees, legal fees, title review and insurance, etc) up to a limit of \$10,000 for landowners placing lands adjacent to scenic streams in conservation easements. Eight streams designated as scenic under state law at the time of this report are segments of: Bear Creek, the Wolf River, Black Creek, the Tangipahoa River, Magee's Creek, the Chunky River, the Pascagoula River and Red Creek. Several others have been nominated. FLP tracts in close proximity or adjacent to scenic streams should be given high priority.

The **State Wildlife Grants Program (SWG)** is another new program established by Congress in 2001 and administered by the MDWFP through the MMNS to direct federal funding to the states for cost-effective conservation aimed at preventing wildlife from becoming endangered. Projects are aimed at protecting priority habitat for Species of Greatest Conservation Need (SGCN) identified through the state's *Comprehensive Wildlife Conservation Strategy* (CWCS) and can be used for an array of protection and restoration efforts on public and private lands. Funding, which is minimal at this time, was contingent on the approval of the state's CWCS by the US Fish and Wildlife Service (USFWS) which occurred in January 2006. Much of the data used to develop the *CWCS* was also adapted for this *AON*, including forest community descriptions

and SGCN dependent on forest communities (See Appendices III, IV and V).

The **Mississippi Natural Heritage Program (MNHP)**, housed within the MMNS, has three major areas of activity: 1) To conduct a comprehensive inventory of Mississippi's ecological resources in order to provide a continuous process for identifying significant natural areas and setting land protection priorities in the state. Information on the status and distribution of exemplary biotic communities, rare and endangered plants and animals, aquatic and marine habitats, geological and other natural features is collected, stored, and analyzed in an integrated data management system. 2) To conduct field surveys to verify the continued existence of a reported occurrence of a rare plant, animal or community type (an "element"), to collect sufficient information on the occurrence, distribution and status of elements (status surveys) to support decision-making concerning prioritization of management activities and to look for new element "occurrences" not previously documented during the inventory process. 3) To conserve outstanding examples of our natural heritage by use of innovative management and protection strategies (working with landowners, developing management plans, monitoring elements of diversity on established natural areas). Mississippi statute defines natural areas as an area of land, water or air, or combination thereof, which contains an element of the state's natural diversity, including, but not limited to, individual plant or animal life, natural geological areas, habitats of endangered or threatened species, ecosystems or any other area of unique ecological, scientific or educational interest. No funding is available at this time to acquire identified natural areas. FLP may help protect some of these designated natural areas that contain unique forest communities.



In 1986, the Mississippi Legislature also established a **Wildlife Heritage Fund**, acquire lands by lease or purchase for hunting, fishing, outdoor recreation and for the preservation of fish and wildlife habitat. Monies are deposited into this fund by extra fees generated from non-resident hunting and fishing licenses, from donations and taxpayers may elect to contribute \$1 of their income tax refund to the fund. This is another program that could complement FLP in the state by leveraging funds to acquire and protect forested tracts that are priorities in both programs.

The **Conservation Reserve Program (CRP)**, established in the 1985 Farm Bill and administered by the USDA Farm Service Agency (FSA), is a voluntary program available to agricultural producers to help them safeguard environmentally sensitive land. Producers enrolled in CRP plant long-term, resource-conserving covers such as trees and grasses to improve the quality of water, control soil erosion and enhance wildlife habitat. In return, FSA provides participants with rental payments and cost-share assistance. Contract duration is between 10 and 15 years for eligible lands that are cropland (including field margins) that are planted or considered planted to an agricultural commodity during four of the previous six crop years, and that are physically and legally capable of being planted in a normal manner to an agricultural commodity or certain marginal pastureland that is enrolled in the Water Bank Program or suitable for use as a riparian buffer or for similar water quality purposes. Preference is given to lands within Conservation Priority Areas (CPAs), selected by state and federal agencies and state technical committees as being particularly environmentally sensitive. In its 20<sup>th</sup> year, Mississippi has over 940,000 acres in CRP. A new offspring of CRP is the **Conservation Reserve Enhancement Program (CREP)**, a voluntary land retirement program that helps agricultural producers protect

environmentally sensitive land, decrease erosion, restore wildlife habitat and safeguard ground and surface water. Landowners with CRP acres are eligible to apply for FLP.

### **Environmental Quality Incentives Program**

**(EQIP)** was created in the 1996 Farm Bill. Fifty percent of the funding must be applied to livestock-related conservation practices.

EQIP is targeted to areas where the most

environmental benefit will be obtained by the designation of CPAs. Each year, CPAs are established within watersheds by the state conservationist based on recommendations of local work groups and the state technical committee. Technical assistance to landowners is provided with 5-10 year contracts. NRCS will work with landowners to prepare a complete conservation plan. Cost-sharing is available for actual costs incurred, up to 75 percent of the costs of conservation practices such as pest management and erosion control. EQIP acres may also be part of a FLP nominated tract.



The new **Healthy Forest Reserve Program (HFRP)** is a voluntary program established to restore and enhance forest ecosystems to promote the recovery of threatened and endangered species, improve biodiversity and enhance carbon sequestration. Signed into law as part of the Healthy Forest Restoration Act of 2003, the program is authorized to be carried out from 2004-2008 under the administration of the USDA NRCS. The





program allows for three enrollment options: 1) a 10-year cost share agreement for which the landowner may receive 50 percent of the cost of approved conservation practices; 2) a 30-year easement, for which the landowner may receive 75 percent of the market value of enrolled lands plus 75 percent of the cost of approved conservation practices; or 3) an easement of not more than 99 years, for which the landowner may receive 75 percent of the market value of the enrolled lands plus the cost of the approved conservation practices. In Mississippi, the gopher frog, gopher tortoise and black pine snake have been targeted by this program for habitat and population recovery activities, and the program is being offered in 14 counties: Covington, Jones, Wayne, Marion, Lamar, Forrest, Perry, Greene, Pearl River, Stone, George, Hancock, Harrison and Jackson Counties.

The **Wetlands Reserve Program (WRP)** was established to restore wetland functions and values to land altered for agriculture and contribute to the national goal of no net loss of wetlands. Previously converted or farmed wetlands are eligible if restoration to a functional wetland is possible. Forestland that was formerly wetland is eligible where the hydrology has been altered. Landowners sell a permanent easement or a 30-year easement to NRCS. A new option is a 10-year Restoration Cost-Share Agreement that does not require an easement. Participating landowners agree to maintain or restore the wetland as directed by a WRP Plan of Operations (WRPO) prepared by NRCS and approved by the USFWS. The landowner receives payment for the easement as well as cost-share assistance for approved projects. Forest management, including harvesting, can be allowed if specifically stated in the plan. The WRPO specifies the timing, amount, method, intensity and

duration of any permitted use. NRCS reserves the right to modify a particular use if conditions of the easement area change, and considers the management plan a living document that can be updated over time. No harvesting methods will be allowed that the NRCS deems are not consistent with long-term protection of the wetland functions and values. In Mississippi there have been approximately 430 WRP easements filed through the end of fiscal year 2005 and protect over 150,000 acres of wetlands. These easements are located in 26 counties, most of which are in the Delta. While some WRP tracts may be eligible for FLP, most WRP priority areas in Mississippi do not overlap with Mississippi's Forest Legacy Areas (see Chapter 6).

The **Wildlife Habitat Incentives Program (WHIP)** also administered by NRCS provides technical advice and cost-share assistance for improvement of wildlife habitat on private lands that focus on national and state priorities such as longleaf pine ecosystems and aquatic habitat restoration. Landowners desiring to participate create a Wildlife Habitat Development Plan (WHDP) with the help of the local conservation district and NRCS staff. Cooperating state wildlife agencies and private organizations may give technical assistance or additional funding for certain projects if the landowner agrees. Because WHIP is focused purely on wildlife benefits, it is applicable to any landowner, tenant, organization, club or business with land suitable for wildlife. The landowner must have a minimum of five acres with at least one acre to be managed under WHIP for wildlife habitat improvements. Agreement periods can be for 5-10 years. Forested WHIP tracts would also be eligible for FLP.



**Mississippi Partners for Fish and Wildlife Program (MPFW)** is a voluntary program administered by the USFWS with approximately 20 federal, state, corporate and non-profit partners that provides technical and financial assistance to landowners who want to restore, improve and protect fish and wildlife habitats on their property. Priority habitats in Mississippi are wetlands, uplands, aquatics, native prairie and longleaf pine ecosystems and the emphasis for this program is habitat restoration. Projects with private landowners must secure a 10-year cooperative agreement and the maximum amount spent per landowner is \$25,000. The overarching goal is to leverage resources of government agencies, organizations, corporations and private individuals to restore, improve and protect fish and wildlife habitats on private lands. Partner tracts that focus on forested wetland, longleaf pine ecosystems and forested uplands may also be FLP candidates.



The USFWS also administers the **Safe Harbor** program for landowners with endangered species on their property. Under this program, landowners enter into a voluntary cooperative agreement with the USFWS or a state agency to improve or manage habitat for existing populations of endangered species. This participation relieves landowners of the responsibility to protect any additional individuals or species that may be attracted by the improved habitat. Landowners who participate in this plan agree to maintain and manage habitat for species such as red-cockaded woodpeckers (RCWs) or gopher tortoise. The

theory behind the program is that original habitat will be protected, most of the new habitat will be maintained and landowners will participate because they will be able to manage all but the original habitat without fear of being charged with violations of the Endangered Species Act (ESA). Safe Harbor tracts may be eligible for FLP.

**The Army Compatible Use Buffer Program (ACUB)** is a tool granted to the military to allow partners and willing landowners with similar goals to preserve land and prevent further development of critical open areas around military installations. An ACUB Program is being proposed for Camp Shelby in the south of Mississippi and will be used as a method used by the Mississippi Army National Guard to protect the intersect between Camp Shelby and nearby urban areas from further restrictions that limit training activity due to an increase in residential growth near their facility. It will also provide a noise buffer to surrounding communities and residents and is designed to prioritize ecologically important areas. If approved, the ACUB Program at Camp Shelby will identify priority sites within a compatible use buffer around the installation and conduct land acquisition from willing sellers or purchase of development rights to maintain priority areas on private lands in a non-developed or natural state. The military has identified partners such as land trusts and natural resource agencies in the state to assist in the location and acquisition of these lands or protection of them through outright fee acquisition or easements. Title or interest will not be held by the federal government. The draft plan was submitted to the Department of Army for approval in 2006. FLP program coordinators should work with the ACUB coordinators to identify tracts that meet the goals of both programs.



The 2007-2011 **Coastal Impact Assistance Program (CIAP)**, administered by the Mississippi Department of Marine Resources (MDMR), lists land acquisition as one of its main focus areas. This program is funded by Congress through the Energy Policy Act of 2005 using funds from the Outer Continental Shelf Lands Act for oil and gas producing states and coastal political subdivision. As one of six states, Mississippi and Harrison, Hancock and Jackson Counties will receive approximately \$120 million during the grant period for the CIAP program projects such as protection of coastal areas and wetlands, implementation of federally approved conservation management plans and mitigation of damage to fish and wildlife. One of Mississippi's program objectives is the acquisition of natural or ecologically important sites for preservation and projects that benefit wetlands of the coastal zone. This program can complement FLP as another acquisition program, and CIAP funds may also be used for implementation of FLP as a federally-approved conservation plan.

The **Coastal Preserves Program** is also administered by MDMR to preserve, restore and protect Mississippi's coastal ecosystems. Today there are 83,000 acres of coastal wetlands and associated habitats in 22 preserves sites. Many of these sites are adjacent to private, forested tracts that could be eligible for application to Mississippi's FLP. Protection of private lands adjacent to coastal preserves would serve to enhance both programs and reduce threats of encroachment and development on and near preserve sites.

## NON-GOVERNMENT PROGRAMS

### NON-PROFIT LAND TRUSTS, CONSERVANCIES AND OTHERS

Land trusts are non-profit organizations created and sustained to preserve green spaces and protect environmentally and/or historically significant areas through direct land protection. They use tools such as conservation easements, estate planning, donations of property and bargain sales. At least seven state and regional land trusts and conservancy organizations are active in protecting environmentally important lands in Mississippi with a focus on conservation easements and land acquisition. There may be other regional and national land trusts that hold easements or own parcels in Mississippi that are not listed here because the state is not their primary area of focus. Land trusts and conservancies such as these are potential partners in the acquisition, management and monitoring of parcels and easements through the FLP. Following the description of land trusts is an overview of other non-government programs such as the National Audubon Society's Important Bird Areas program and a discussion of tribal lands in the state.

**Delta Land Trust (DLT)** was founded in 1989 to protect, restore and enhance the bottomland hardwood forests of the Mississippi River Alluvial Plain in Arkansas, Louisiana and Mississippi. Today, they operate statewide in Mississippi where they hold 3,600 acres in conservation easements, own 80 acres and have assisted in the protection of an additional 400 acres. They hold 14,200 acres under easements in Arkansas and Louisiana, and own 200 acres in Louisiana.

The **Land Trust for the Mississippi Coastal Plain (LTMCP)** was founded in 2000 to conserve protect and promote open spaces and green



spaces of ecological or cultural significance in the counties of the Mississippi Coastal Plain – George, Hancock, Harrison, Jackson, Pearl River and Stone Counties. They protect lands that meet established criteria through fee simple ownership and conservation easements. They also promote grassroots conservation through education and community partnerships. They hold easements or own 19 properties covering 526 acres.

The mission of the **Mississippi Land Trust (MLT)** is to improve flora and fauna resources of Mississippi, to hold land conservation interests, to educate the public about conservation and to develop incentive based conservation programs. Their focus areas are prairies, red clay hills, bottomlands and bayous, coastal savannas, longleaf pine forest and scenic rivers and streams. Since their inception in 1998, they have acquired 43,000 acres in easements across the state. MLT's sister organization, the **Mississippi River Trust (MRT)**, was created in 2002 to focus regionally. Their goals are to conserve the ecology and natural environment of the Mississippi River Valley through donation of easements, to collaborate with government and private agencies on conservation and planning problems as they relate to the MRV, to acquire and hold title to lands and conservation interests in the Mississippi River watershed to protect them from development and to educate the public about conservation. Their area of operation is the Mississippi River Valley from Minnesota to the Gulf of Mexico.

**The Nature Conservancy (TNC)** has operated in Mississippi since the 1960s and their chapter office was founded in 1989. Since inception they have protected over 133,000 acres through purchase, partnership or easements throughout the state. Their mission is to find, protect and

maintain the best examples of natural communities, ecosystems and endangered species in Mississippi. Today, the Chapter operates statewide and has four field offices: Jackson, the Mississippi Gulf Coast, Tupelo and Camp Shelby. TNC uses their conservation area plans (CAPS) to prioritize the highest priority places that, if conserved, promise to ensure biodiversity over the long-term.

The **Wolf River Conservancy (WRC)** works in Benton County, Mississippi and Fayette and Shelby Counties in Tennessee to conserve and enhance the Wolf River as a natural resource for public education and low impact recreation. Their goal is to establish a protected public greenway along the 90-mile Wolf River from its headwaters near Holly Springs, Mississippi, to its mouth at the Mississippi River in Memphis, Tennessee. They own 60 acres in Mississippi and 551 acres in Tennessee and hold easements on 1,141 acres in Tennessee and helped acquire another 5,894 acres that are in public ownership.



The **Wolf River Conservation Society (WRCS)** was established in 1998 to conserve, manage and protect the Wolf River and its watershed from the headwaters to its termination at the Bay of St. Louis in south Mississippi. The Wolf River watershed is in parts of Hancock, Harrison, Lamar and Pearl River Counties. The WRCS currently holds easements on approximately 1,500 acres along the river.





**Wetlands America Trust (WAT)** is Ducks Unlimited's fiduciary arm that holds conservation easements. Their main focus is protection of bottomland hardwood forest and existing wetlands in the Lower Mississippi Valley. In Mississippi, they focus on the upper and lower Delta with emphasis on the batture lands of the Mississippi River and on areas like the Big Black River drainage – one of the least disturbed streams in the state. WAT holds 55,000 acres under easements in Mississippi.

BirdLife International is a global partnership of conservation organizations that strives to conserve birds, their habitats and global biodiversity, working with people towards sustainability in the use of natural resources. The National Audubon Society, as the Birdlife International Partner for the U.S., is responsible for identifying and conserving a network of globally important **Important Bird Areas** (IBAs) in the U.S. IBAs are sites that provide essential habitat for one or more bird species and include sites for breeding, wintering, and/or migrating birds. They range from a few acres to thousands of acres in size, but usually they are discrete areas that stand out from the surrounding landscape. IBAs may include public or private lands, or both, and they may be protected or unprotected. The goal of the IBA program is to recognize sites that consistently harbor a significant abundance of birds, especially birds of concern, or those vulnerable because they congregate in large numbers. These areas serve as focal areas for Audubon bird conservation projects such as population monitoring, habitat restoration and environmental education. To date, Audubon and its collaborators have identified 35 IBAs in Mississippi primarily on public lands. Protection of private forested lands adjacent to identified

IBAs in the state will aid Audubon in expanding the role of IBAs for focal bird species.

**Tribal Lands** - The **Mississippi Band of Choctaw Indians** is the only tribe in the state listed in the federal register. They own almost 29,000 acres of tribal lands spread in multiple tracts across several counties primarily in east-central Mississippi. Some of these tracts are actively managed for timber and wildlife habitat.

Forested private lands adjacent to tribal lands that are managed for timber and wildlife should be identified for potential FLP application to enlarge the area maintained as forests. The FLP program should also consider tribal lands slated for development and evaluate the private forested lands adjacent to them for potential protection through the FLP program.



### CORPORATIONS

Forest products companies such as pulp and paper companies own and or control management on significant amounts of forest land in Mississippi, many of which include unique resources and opportunities for public use and benefit. Resource protection programs consist of two types: those the industries initiate voluntarily by company policy and those that involve cooperative agreements with government agencies and conservation organizations. For instance, a portion of the Wolf River and Little Biloxi Wildlife Management Areas in southeast Mississippi are owned by Weyerhaeuser and managed by the MDWFP via a Memorandum of Agreement.



The **Sustainable Forestry Initiative (SFI)** program is a standard of environmental principles, objectives and performance measures that integrate the perpetual growing and harvesting of trees with the protection of wildlife, plants, soil and water quality with a wide range of other conservation goals. An independent Expert Review Panel consisting of representatives from the environmental, professional, conservation, academic and public sectors, reviews the program. Through SFI, of the American Forest & Paper Association are attempting to change the way that private forests are managed in the U.S.

### MISSISSIPPI LAWS, REGULATIONS AND INCENTIVES FOR FOREST LANDOWNERS

**Mississippi's Uniform Conservation Easement Act** became effective March 27, 1986. This law allows an easement to be created on real property for purposes which include "retaining or protecting natural, scenic, historical or open-space values, assuring its availability for agricultural, forest, recreational, educational or open-space use, protecting natural features and resources, maintaining or enhancing air and water quality or preserving the natural, historical, architectural, archaeological or cultural aspects of real property." This law allows for a conservation easement to be filed in the State of Mississippi in accordance with IRS code and U.S. Treasury regulations.

There are three important aspects of any conservation easement that must be met as defined under the Uniform Conservation Easement Act.

First, the easement must meet a definite conservation purpose. Second, in order to qualify as a conservation easement under the Uniform Act, the easement must be granted to or beheld by a "qualified conservation

organization." Simply stated, the landowner donates the specific rights they have chosen to relinquish to the conservation organization of their choosing via execution of the easement document. The law defines the qualified conservation organizations to include certain local, state, or federal governmental agencies whose primary purpose is the conservation of natural resources. The law also allows donations to publicly supported, private conservation organizations such as land trusts.

The conservation organization which holds the easement does not actually acquire the rights donated by the conservation easement. Rather, the easement gives the conservation organization the right and responsibility to monitor and enforce the restrictions placed on the property and ensure adherence to the easement document through perpetuity. The landowner must clearly define and communicate, through the easement document, the rights they are giving up. The easement does not give the conservation organization, or easement holder, any ability to exercise any rights that the landowner has specifically chosen to restrict. Also, conservation easements do not allow public access to the property unless specifically provided in the easement document.

A third aspect of the conservation easement process is the development of what is referred to as a baseline ecological assessment. This assessment is commonly conducted by resource professionals experienced in understanding ecological progression and associated plant, animal, and physiographic details. It is literally an ecological snapshot of the property at the time of the conveyance. The baseline ecological assessment is important, in that it establishes and records the condition of the property as well as the land uses that exist when the conservation easement is established. The baseline document is then utilized by the conservation



organization or agency, serving as the easement holder, to monitor the property and the conditions that exist on the property through time.

In August 2006, President George Bush signed a new law expanding the federal conservation tax incentive for conservation easements donated in 2006 and 2007. This new law raises the deduction a landowner can take for donating an easement from 30 percent of their adjusted gross income to 50 percent. It also allows qualifying farmers and ranchers to deduct up to 100 percent of their income and extends the carry-forward period for a donor to take tax deductions for a voluntary conservation agreement from 5-15 years. While these changes are for 2006 and 2007 only, there is an effort underway to encourage Congress to make these new incentives permanent.

**Mississippi Reforestation Tax Credit** provides a Mississippi income tax credit of up to 50 percent of the cost of approved hardwood and pine reforestation practices. This tax credit promotes reforestation on private, non-industrial forest lands. The lifetime limit is \$10,000 and any unused tax credit may carry over to future years. Landowners must have a reforestation plan prepared by a graduate or registered forester. Acreage enrolled in a state or federal incentive program generally is not eligible and cost of planting orchards, Christmas trees or ornamental trees does not qualify. The work must be verified by the forester on Mississippi Tax Form 80-315 as completed according to the prepared plan and submitted to the Mississippi State Tax Commission by the landowner.

**Federal Reforestation Tax Credit and Amortization** is also available to qualified landowners. A landowner can claim up to 10 percent tax credit up to \$10,000 for reforestation expenses. The same expenses can

be deducted annually over a seven-year period.

The FLP, in combination with constitutionally provided tax relief described above, can provide additional economic benefits to landowners to help slow and prevent the further conversion of natural forest communities in Mississippi to urban sprawl and other non-forest uses.

### PUBLIC LAND IN MISSISSIPPI AND FLP

As stated in Chapter 1, only 11 percent of Mississippi forestland is in public ownership. Mississippi has ten national wildlife refuges, six national forests, seven national parks, 24 state parks, and 42 state wildlife management areas, one national estuarine research reserve, 83,000 acres of coastal preserves and thousands of acres of lands managed by the U.S. Army Corps of Engineers. There are also 673,106 acres of 16th Section lands in the state, thousands of acres of forest land owned by Institutions of Higher Learning and 280,000 acres owned by the Department of Defense. Where possible, strategically acquiring forest legacy tracts adjacent to these public forestlands may, in some cases help build biological corridors among blocks of public lands, thus improving the return on the investment of program dollars and the ecological value of the natural communities in those tracts.



THIS PAGE LEFT  
BLANK INTENTIONALLY.







## CHAPTER 5: IMPLEMENTING MISSISSIPPI'S FOREST LEGACY PLAN

Increasing interest by Mississippi landowners to protect special and environmentally important forest lands and requests by other agencies, conservation organizations and land trusts led the MFC to seek permission from Mississippi Governor Haley Barbour to facilitate the state's acceptance into the FLP in March 2005 (see letters in Appendix I). MFC is a public service agency created by the Mississippi Legislature. Their mission is to provide leadership in forest protection, forest management and information about the forest of Mississippi, through a fully informed, well-trained work force and support staff, reflecting the needs of the public and employees. In 2005, the MFC in consultation with the Mississippi Forest Stewardship Committee created a FLP Subcommittee to aid in the development of the FLP Assessment of Need document. MFC also contracted with Elizabeth Barber, Certified Wildlife Biologist, of Barber and Mann, Inc. to compile the data and prepare the draft AON for stakeholder and public input on behalf of the committee.

The FLP will play an important role in the protection of environmentally important forest resources in Mississippi. The FLP will supplement existing programs administered by federal, state and local agencies, land trusts and conservancies, forest products companies and conservation organizations whose efforts are focused on conserving forest resources on private lands (see Chapter 4 for program descriptions). The FLP process can also provide improved coordination of efforts among interested organizations and individuals that can participate as partners to achieve protection of significant forest resources.



The FLP offers landowners an opportunity to voluntarily protect environmentally important forest resources by donating land or donating or selling development rights through conservation easements that identify key resource values and establish management goals and land use restrictions. In this way FLP can help maintain the forestland base,



protect special forest resources and provide opportunities for traditional forest uses for future generations. Although landowners that participate in FLP may choose to donate or sell fee title to their lands, in some cases conservation

easements will be the preferred method of protecting important forestlands. Limited federal funds will in many cases be better utilized through easements, and there are certain advantages to landowners and local communities to the land remaining in private ownership. FLP acquisitions involve willing sellers only, and will be based on federal appraisal standards.

### STAKEHOLDER AND PUBLIC PARTICIPATION

Stakeholder and public involvement has been a key factor in defining Mississippi's approach to Forest Legacy from the beginning of the state's effort. The Forest Stewardship Committee appointed a FLP Subcommittee that held an introductory meeting in March 2005 to learn more about the FLP, to begin identifying other potential stakeholders and sources of data needed to develop the *AON*. The FLP Subcommittee invited additional members from other agencies, land trusts conservancies and conservation organizations who participated in second

working meeting in July 2005. During this meeting, the subcommittee members identified potential Forest Legacy Areas (FLAs) in two breakout sessions and described unique features and threats for each (see Chapter 6). A third meeting was scheduled in September, 2005 but was cancelled because of the difficulties caused by the aftermath of Hurricane Katrina which made landfall in Mississippi on August 29, 2005.

The MFC staff and their contractor held subsequent meetings with individual committee members, conducted phone and personal interviews with staff and other agencies and related program coordinators to gather additional data and input regarding the designation of FLAs over the next several months. Additional assistance was provided by the Mississippi Natural Heritage Program and Mississippi Museum of Natural Science staff who submitted significant ecological data and analyses needed to refine target FLAs in the state. The staff also consulted with the USDA Forest Service FLP contacts regularly to ensure the process of developing the FLAs followed the law.

As a result of these meetings, interviews and data gathering, the draft *AON* was developed and posted on the MFC website for public review and comment in November 2006. The goals of the public involvement process were 1) to provide information to stakeholders and the public about the FLP; and 2) to elicit any concerns, suggestions or general comments about the FLP.

A press release was sent to statewide newspapers in October, 2006 announcing a public meeting to review and take input on the Forest Legacy draft *AON*. An announcement about the public meeting was also sent to members of Mississippi's Forest Stewardship Committee, their



FLP Subcommittee and representatives of stakeholder organizations such as conservation groups, land trusts and landowner organizations. The public meeting was held on November 16, 2006 at the Mississippi Fire Training Academy in Pearl, Mississippi. Eleven people attended the meeting and offered comments and suggestions which have been incorporated into the AON. Other comments were sent via e-mail and mail by individuals and organizations not attending the meeting. The Draft AON was also posted on the MFC website in October 2006 and public comments were invited as well.



As the lead FLP agency in Mississippi, the MFC will distribute, through the Mississippi Forest Stewardship Committee, copies of the approved AON document to key organizations and individuals in the state. In addition, MFC will initiate timely outreach efforts to generate publicity among land trusts, other agencies and organizations and landowners. Organizations and agencies such as the Mississippi Cooperative Extension Service, the Mississippi Wildlife Federation, The Nature Conservancy, the Mississippi Fish and Wildlife Foundation, the USDA Natural Resources Conservation Service, the Mississippi Forestry Association, the Natural Resources Initiative of North Mississippi and the Mississippi Soil and Water Conservation Commission have established outreach networks in the state with private landowners and land managers and MFC will work cooperatively with them and others to promote the FLP. Newsletters, MFC's website, press releases, articles, brochures, special mailings, field staff and public meetings will also be used to provide continuing publicity about the Forest Legacy Program.

Based on oral and written responses from all constituencies, the major public issues concerning the FLP in Mississippi are summarized in Appendix VI.

### PROGRAM GOAL AND OBJECTIVES

According to the enabling federal legislation (Appendix II), the Forest Legacy program mandate is to **ascertain and protect environmentally important forest areas that are threatened by conversion to non-forest uses** and to **promote forest land protection and other conservation opportunities**, including the protection of important scenic, cultural, fish, wildlife, and recreational resources, riparian areas and other ecological values.

Within this framework, Mississippi's FLP objectives were derived from input from the Forest Stewardship Committee, its FLP Subcommittee and public and stakeholder participation process and will be used to determine which eligible tracts will receive priority for participation in the program. Objectives are aimed at protecting forest resource values that stakeholders and the public consider of greatest concern. It should be emphasized that although the FLP includes timber production potential when significant forestland conversion threats exist, the primary focus of the FLP is on protecting non-timber resources and values considered to be most threatened.



### MISSISSIPPI FOREST LEGACY PROGRAM GOAL:

*To protect environmentally important forests in Mississippi threatened by conversion to non-forest uses.*

### MISSISSIPPI FOREST LEGACY PROGRAM OBJECTIVES:

- ◆ To sustain native or rare and unique forest ecosystems
- ◆ To protect water quality
- ◆ To protect forests from development along lakes, rivers and to buffer protected lands
- ◆ To protect wildlife habitat
- ◆ To maintain traditional forest uses, including hunting and fishing
- ◆ To sustain productive forests
- ◆ To provide public recreation opportunities

### IDENTIFICATION OF ENVIRONMENTALLY IMPORTANT FORESTS

This AON identifies three FLAs where protection efforts and funding provided by FLP should be applied if Mississippi is accepted into the program. They are the Southeast FLA, the Northeast Mississippi FLA and the Central Mississippi FLA. For each of the three FLAs, the AON identifies (1) the general characteristics and environmental values at risk; (2) describes the kinds of threats to those values in the FLA; and (3) specifies the FLA's geographic boundaries (counties and watersheds) within which priorities may be considered for the program (Chapter 6). This AON also presents the evaluation criteria and scoring that will be used to rate potential parcels where acquisition of property development rights or outright acquisition may be pursued.

The three FLAs and the process used to identify them are described in Chapter 6.

### OBTAINING INTEREST IN LAND

According to the legislation, participating states, through their lead agency, may acquire from willing landowners lands and interests therein, including conservation easements and rights of public access, for FLP purposes. The protected properties must be held in perpetuity.



The state of Mississippi as empowered by the federal government through the MFC, shall identify the environmental values to be protected by entry of the lands into the program, management activities which are planned and the manner in which they may affect the values identified, and obtain from the landowner other information determined appropriate for administration and management purposes.

### LANDOWNER PARTICIPATION

Landowner participation in the program is voluntary and consists of two elements:

1. Conveyance of lands and interests to achieve the purpose of FLP; and
2. Preparation of periodic updates to a Forest Stewardship Plan or a multi-resource management plan. The landowner and State Forester must approve the plan prior to signing the acquisition of the easement. The plan shall include provisions to meet the land





conservation objectives of the FLP and should be updated as needed. Modifications of the plan must be agreed to by the MFC. A plan is not necessary if lands are purchased in fee.

## APPLICATION

Establishment of conservation easements and/or fee simple acquisition must begin with interested landowners. Eligible landowners that are interested in the FLP may submit applications to the State Forester through the Forest Legacy Coordinator by **August 15**. Application will be made on the form contained in this AON (Appendix VII). Lands and interests in lands identified within a FLA under FLP authority may only be acquired on a willing seller/willing buyer basis.

## SELECTION PROCEDURE

Landowners interested in FLP participation should decide whether they prefer a conservation easement to Mississippi's FLP or to convey fee simple interest to the FLP and should submit an application. Easements may be held by government entities where the donee agrees to accept the easement and the donor agrees to manage the lands for Forest Legacy purposes. Organizations eligible by law to hold easements donated to the Program include USDA Forest Service, state or local agencies. If easements are donated, a land trust or conservation organization may hold the easement.

Mississippi's Forest Legacy subcommittee will review and evaluate FLP applications at least annually and make recommendations regarding the value of tracts to Mississippi's FLP. The selection process will produce a list of landowner applications that will be prioritized for inclusion and

potential funding. The prioritized list will, in turn, be considered and approved by the Forest Stewardship Committee in consultation with the State Forester. Recommended tracts will be appraised using federal appraisal standards, and landowners will be informed of their fair market value.

The Forest Stewardship Committee's approved list will then be submitted to the USDA Forest Service's Regional Office in Atlanta. The Forest Service will make the final determination as to which conservation easements or lands will be acquired with federal funds, or, in the case of donations, will be approved for inclusion in the Program under (75 percent federal/25 percent non-federal) cost-share agreements. All acquisitions will be made subject to availability of federal funds.

Following completion of the prioritization and approval process, easements will be purchased or conveyed as charitable donations, or tracts will be purchased from the willing seller(s). The agency that holds the purchased easements may be the managing agency for all acquired FLP fee lands or may delegate or assign monitoring, management and enforcement responsibilities over lands and interest in lands acquired under FLP to other federal agencies or state or local governments. The governmental agency responsible for monitoring, management and enforcement may in turn delegate or assign management and monitoring to land trust or conservation organizations.



Competition for Forest Legacy dollars is fierce across the nation and funding is limited. Only the most significant forest properties are likely to receive program dollars. Program history suggests that only one or two properties will likely be protected via purchased easements or fee purchases each year depending upon tract size, development value, landowner interest and future funding. The potential for donated easements is much broader. Forest Legacy dollars can be applied to the transactional costs associated with donations of working forest conservation easements.

Because funding may be limited in a given year, larger tracts may need to be broken into phases to adequately fund their conservation easement acquisition.

## PARCEL ELIGIBILITY CRITERIA

### NATIONAL GUIDELINES

According to the Federal legislation (Appendix II), Forest Legacy Areas “shall have significant environmental values or shall be threatened by present or future conversion to non-forest uses”. In accordance with the law “priority shall be given to lands that can be effectively protected and managed, and which have important scenic or recreational values; riparian areas; fish and wildlife values, including threatened and endangered species; or other ecological values.”

Further, the USDA Forest Service’s *FLP Implementation Guidelines* and *Project Scoring Guidance* for regional and federal funding emphasize **four**

**core national criteria** that will be used will be applied to score and rank FLP projects. Those criteria are:

1. **Importance** - The environmental, social, and economic public benefits gained from the protection and management of the property. More points will be given to projects that demonstrate multiple public benefits at the national or multi-state scale. This criterion reflects the ecological assets and the economic and social values conserved by the project and the scale of people’s interest in its protection. It is meant to assess the attributes to be conserved and the size of the community receiving those benefits.

Attributes that will be considered in evaluating projects nationally for importance:

- ◆ **Threatened or endangered species habitat** – Site has known individuals and/or habitat for federally designated rare, threatened or endangered plants and animals or includes unique forest types or communities.
- ◆ **Water supply protection** – Contiguous riparian area, sensitive watershed lands, lakefront, buffer to public drinking water supply or an aquifer recharge area.
- ◆ **Forestry** – Landowner demonstrated sound forest management and/or is integral in supporting the local resource-based economy for a community or region and the tract is a foundation to maintain the economic viability of forestry for the community or region.



- ◆ **Public access** – The property has full or limited access, and may include specific use restrictions.
- ◆ **Scenic** – Located within a formally designated scenic viewshed.
- ◆ **Fish and wildlife habitat** – Important fish or wildlife habitat exists as specified by a wildlife conservation plan or strategy.
- ◆ **Historic/Cultural** – Formally designated cultural and historical features are located on site.

2. **Threatened** - This criterion reflects an estimate of the likelihood of conversion. First, evaluators will determine if legal protections exist on the property that removes the threat of conversion. Then, they will consider (1) landowner's circumstances (good land steward interested in conserving land, property held in an estate, aging landowner and future use of property by heirs is uncertain, property is up for sale or has a sale pending, landowner has received purchase offers) and (2) adjacent land use changes (rate of development growth and conversion, rate of population growth, rate of change in ownership).



Additional consideration will be given to projects that will prohibit any additional structures or subdivision of the property.

3. **Strategic** – Does the project fit within a larger conservation plan, strategy, or initiative as designated by either a government or non-

governmental entity and is strategically linked to enhance previous conservation investments (either FLP or other investments)? This criterion reflects the project's relevance or relationship to conservation efforts on a broader perspective.

4. **Project Readiness** - The evaluators want to know that there is local support for the project, that it can be completed and the organization has the means and capacity to complete it. They will use a graduated scale indicating the level of commitment and likelihood a project will be completed in a predictable timeline.

Project readiness attributes they will consider:

- ◆ Completed appraisal review that meets federal appraisal standards.
- ◆ Landowner and easement holder have agreed to easement or fee acquisition conditions.
- ◆ Cost share commitment from a specified source, either in writing or in hand.
- ◆ Signed option or purchase and sales agreement held by the state or at the request of the state.
- ◆ At the request of the state, conservation easement or fee title held by a third party.
- ◆ Completed title search.
- ◆ Completed Forest Stewardship Plan (or multi-resource management).

Project readiness is a criterion that reflects the degree of due diligence applied and the certainty of a successful FLP project. It is intended to be a guide to project selection decisions. The readiness level is determined by the cumulative progression of items completed.



Tracts will be scored on importance, degree of threats and strategicness. Project readiness is not scored, but will be considered for each tract.

#### OTHER NATIONAL GUIDELINES

**For a landowner to participate in the program, it is not required that their tracts be completely forested.** However, priority will generally be given to tracts that are currently forested or are identified to be forested in the landowner's Forest Stewardship Plan or multi-resource management plan. Non-forest uses are those uses that may be compatible with forest uses as part of an undeveloped landscape, including cultivated farmland, pasture, grassland, shrubland, open water and wetlands. **Those non-forest uses should be less than 25 percent of the total area.** Non-compatible uses are those inconsistent with maintaining forest cover, including, but not limited to, activities that result in extensive surface disturbance such as residential and commercial development and surface mining. These uses will be excluded from FLP conservation easements or land purchases in Mississippi. **Reserved areas** are designated areas where non-forest uses (houses, barns, recreational camps, etc.) are or will be allowed, but are inseparable from the land holding or do not have a detrimental effect on the conservation easement values. These areas shall be defined and described in the conservation easement and may be restricted in terms of their use, or provisions made through cost and time to cure and treat. **Priority will be given to tracts with no buildings or reserved areas.**

#### MISSISSIPPI GUIDELINES

The parcel eligibility criteria below reflects both USDA Forest Service Program FLP *Implementation Guidelines* and the State Forest Stewardship Committee's objectives for the FLP. To be eligible for inclusion in Mississippi's FLP, a completed application and all required information must be submitted to MFC by the August 15 deadline and the private forestland tracts must:

1. Be **threatened by conversion** to non-forest uses.
2. Be owned by landowners that are **willing** and interested in donating or selling conservation easements, reserved interest deeds or fee title through the FLP.
3. **Contribute to more than one of the following objectives of Mississippi's FLP**
  - ◆ Sustain native or rare and unique forest ecosystems
  - ◆ Protect water quality
  - ◆ Protect forests from development along lakes, rivers and buffer protected lands
  - ◆ Protect wildlife habitat
  - ◆ Maintain traditional forest uses, including hunting and fishing
  - ◆ Sustain productive forests
  - ◆ Provide public recreation opportunities





4. **Possess environmental values that can be protected and managed** effectively through conservation easements or fee simple acquisition at reasonable costs.

When judging whether a tract has environmental values that can be protected and managed efficiently the MFC, FSC and the FLP Subcommittee should consider:

1. The nature of environmental values proposed for protection and whether they can be monitored effectively and economically.
2. Whether the tract is likely to become isolated from other areas maintained for important forest resources by development on adjacent tracts.
3. Whether the landowner's management objectives are compatible with the protection of resources they propose.
4. Whether a land trust, conservancy, public agency or other appropriate organization has expressed an interest in working with MFC and the landowner to establish and monitor the easement.
5. Whether other sources of funding for tract acquisition, easement closing, monitoring and other associated costs are available.

Owners of eligible forestlands within one of the three designated FLAs that meet the eligibility criteria and application requirements set forth in this AON may submit an application.

### COST SHARE REQUIREMENTS

The maximum federal contribution for total program costs may not exceed 75 percent. Thus a minimum non-federal contribution of 25 percent that meets Forest Legacy purposes is required. The **non-federal cost share** may consist of 1) the value of land, or interest in land, dedicated to FLP that is not paid for by the Federal government; 2) nonfederal costs associated with program implementation; and 3) other non-federal costs associated with a grant or other agreement that meets FLP purpose. The non-federal cost-share must be documented. It can occur at any phase of the FLP including planning, developing future projects, acquisition, capital improvement, management or administrative activities. Donations of land or interests in land must be documented to count as non-federal cost share.

**Federal project funds** are those used by MFC to directly purchase lands. Project funds may be used to cover transaction costs including appraisals and appraisal review, land surveys, closing costs, baseline documentation reports, title work, purchase of title insurance, conservation easement drafting or other real estate transaction expenses for FLP tracts. Project funds may also be expended to facilitate donations of land or interests in lands to a qualified or willing donee for FLP purposes, by paying expenses directly related to the donation, including, but not limited to, land surveys, conservation easement drafting, title work and establishing baseline information. For an outright donation of a conservation easement, FLP program funds **may not** be used to pay for an appraisal. In the case of a partial donation of a conservation easement or land, an appraisal meeting federal standards is required to determine the value of the property. FLP funds may be used for appraisals on these partial donations.



## APPLICATION DEADLINES

Because Forest Legacy is federally funded, it is presently subject to annual appropriations. In order to assess the need for FLP dollars, Congress asks for a list of potential Forest Legacy projects a year in advance of the next fiscal year which begins October.

Appraisals are performed for the purposes of FLP. Landowners should consult their tax professional to discuss tax benefits.

Applications must be received in hand **August 15** by the close of business by:

**Forest Legacy Coordinator**  
Mississippi Forestry Commission  
301 North Lamar Street  
Suite 300  
Jackson, Mississippi 39201  
601-359-1386  
[www.mfc.state.ms.us](http://www.mfc.state.ms.us)  
[jdematteis@mfc.state.ms.us](mailto:jdematteis@mfc.state.ms.us)





## CHAPTER 6: MISSISSIPPI'S FOREST LEGACY AREAS

### SELECTION OF FLAS

After Governor Barbour designated the Mississippi Forestry Commission as the lead agency for the Forest Legacy Program in Mississippi, the MFC's Forest Stewardship Committee elected to appoint a Forest Legacy Subcommittee to begin planning for the development of this FLP Assessment of Need. During their planning meetings in 2005 and 2006, the FLP subcommittee, in facilitated meetings, developed the overarching goal for Mississippi's FLP, which mirrors the national goal:

*To protect environmentally important forests in Mississippi threatened by conversion to non-forest use.*

They also established objectives for the Mississippi FLP:

- ◆ Sustain native or rare unique forest ecosystems.
- ◆ Protect water quality
- ◆ Protect forests from development along lakes, rivers and to buffer protected lands
- ◆ Protect wildlife habitat
- ◆ Maintain traditional forest uses, including hunting and fishing
- ◆ Sustain productive forests
- ◆ Provide public recreation opportunities



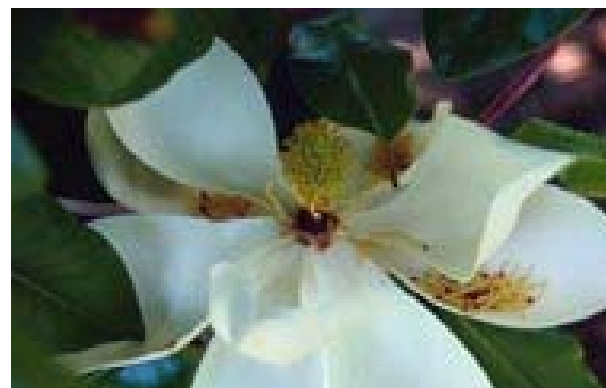
Once the state goal and objectives were established, the subcommittee broke into two groups (called Red and Blue) to discuss and identify general areas of the state to be considered



as potential Forest Legacy Areas (FLAs) based on data from several conservation plans such as, natural forest community rankings from the Mississippi Natural Heritage Program (NHP) and other available data. The Red and Blue groups identified various areas for consideration based on the national criteria for FLAs and the state goal and objectives. The initial lists of potential FLAs included target physiographic regions of the state, riparian areas, watersheds, and buffers around large tracts of public land such as and of potential forest legacy areas. For a combined list of the original draft areas that were considered for the Forest Legacy Program by ecoregion, see Appendix VI (Public Comments).

Following these initial meetings of the FLP subcommittee, the MFC staff then collected additional information about the natural forest communities in each potential legacy area, population changes and changes in forest cover in recent years and tried to determine where forests (by county) are currently or soon will be most imperiled by conversion to non-forest use. In addition to the expertise and input of the FLP subcommittee members and others, U.S. Census data was used to identify areas of significant population growth from 1990 to 2000 and areas projected to experience significant growth from 2005 to 2015 in the

state. Refer to population maps and discussion in Chapter 3. Also, information about threats to natural forest communities and species of greatest conservation need as described in the Mississippi *CWCS* was used to develop the FLAs (Chapter 1 and Appendices III, IV and V).





To further assist the effort of identifying environmentally important forest in the state threatened by conversion, the NHP developed a map of Tier 1, 2 and 3 priority areas in Mississippi to use in considering potential FLAS. Figure 17 depicts areas of the state with large numbers of threatened and endangered species, natural communities, scenic streams and riparian areas that the NHP deems as most important for protecting biodiversity. Figure 18 indicates Mississippi's population density by county.

Figure 17:  
Priority Areas of  
Mississippi for  
Biodiversity and  
Conservation, *Source*  
*Mississippi Natural*  
*Heritage Program,*  
*Mississippi Museum*  
*of Natural Science*

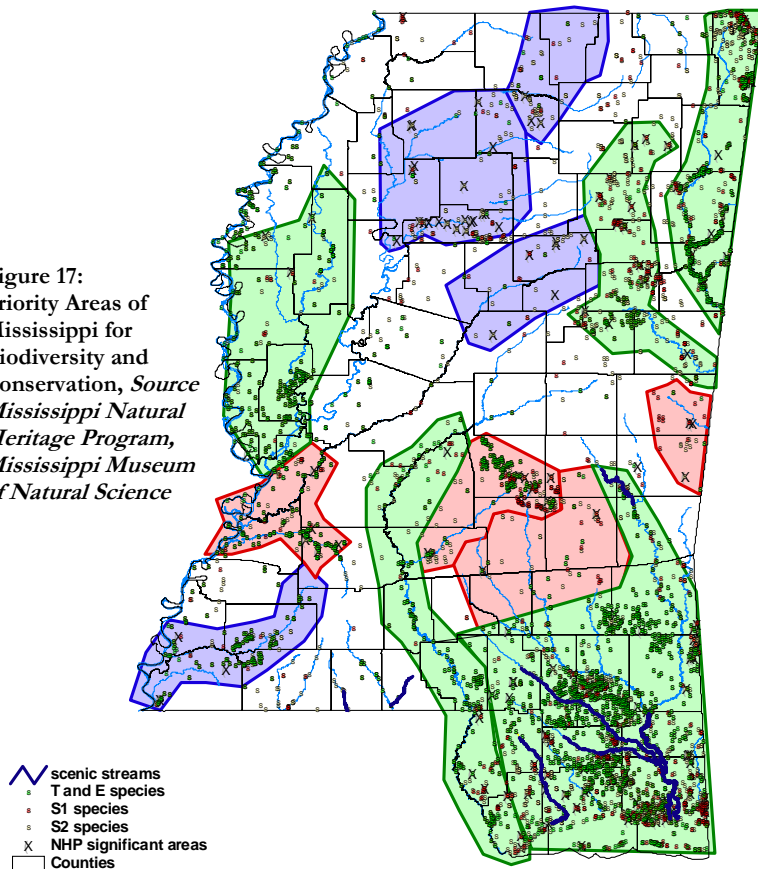
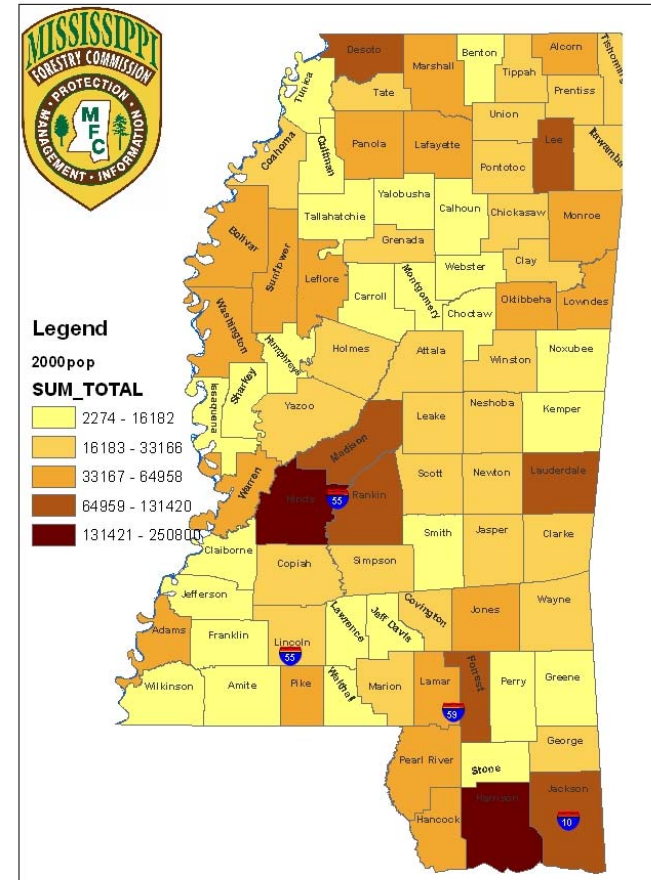


Figure 18:

### Mississippi 2000 population



Factors the NHP included in the development of this reference map were:

1. Elemental occurrence of federally listed threatened and endangered plant and animal species.
2. State ranked plant and animal species in two categories: S1 (critically imperiled in Mississippi because of extreme rarity or



because of some factor(s) making it vulnerable to extirpation) and S2 (imperiled in Mississippi because of rarity or because of some factor(s) making it vulnerable to extirpation).

3. Location of state and federal designated scenic streams.
4. Natural Areas identified and tracked by NHP as important and rare communities.

The NHP also provided a spreadsheet of elemental occurrences of S1, S2 and threatened and endangered species by county (Appendix VIII).

From all of this data and input, three Forest Legacy Areas (Southeast, Central and Northeast) were identified that generally fall within the Tier 1 areas identified by the NHP and had or are projected to have significant population growth or already experience large population growth and as a result are undergoing forest conversion to non-forest use now (such as the Jackson metro area, the three coastal counties, the Hattiesburg area and Lee county - see figures 17 and 18). The Central and Northeast FLAs were further refined to cover important watershed boundaries where possible, based on public comments and guidance for USDA Forest Service staff. The draft FLAs were presented to the Mississippi Forest Stewardship Committee in June 2006, and during the public meeting held in November 2006, and were posted for comment on the MFC website.

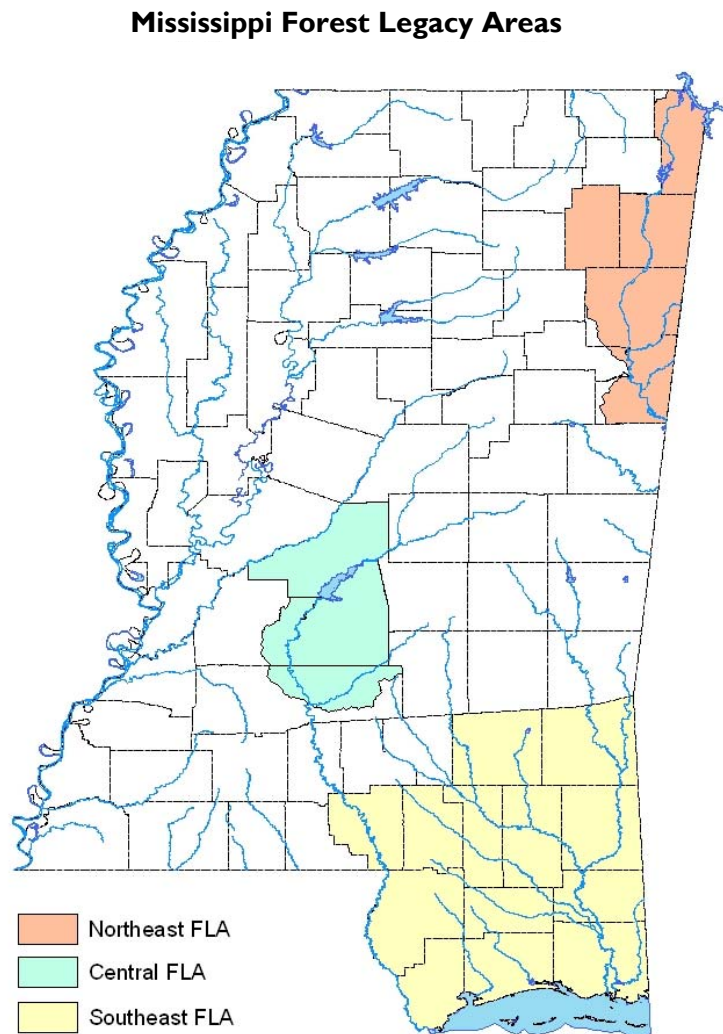
**Important Note:** Some areas that were suggested for the FLP were eliminated after reviewing population change data and MNHP data, because the threat of conversion to non-forest use in these areas appears to be low at this time. Examples of areas eliminated are the Yazoo/Big

Sunflower drainages and the southwest Mississippi area. While these areas are certainly ecologically significant, the threat of conversion is low. They will be analyzed again in future iterations of this AON for possible inclusion.

The following pages include a map of the State of Mississippi depicting all three legacy areas (Figure 19), a list of values and priority conservation areas, important public lands and threats to forest communities. Also included is a table for each legacy area indicating population statistics, forest cover and species of concern by county. Sources of data are U.S. Census, Mississippi Institutions for Higher Learning (population projections), MFC and Forest Inventory data, and the Mississippi NHP.



Figure 19:



## SOUTHEAST LEGACY AREA- PRIORITY 1

**Ecoregion:** East Gulf Coastal Plain

Thirteen counties comprise the Southeast Legacy Area – Forrest, George, Greene, Hancock, Harrison, Jackson, Jones, Lamar, Marion, Pearl River, Perry, Stone and Wayne Counties.

Figure 19:



## CHAPTER 6: MISSISSIPPI'S FOREST LEGACY AREAS

**Table 4: Population and Forested Area of the Southeast FLA**

COUNTIES	POPULATION (2000)	% GROWTH 1990-2000	% PROJECTED GROWTH 2005-2015	TOTAL ACREAGE IN COUNTY 2000	FORESTED AREA (ACRES) IN COUNTY-2000	% FORESTED	2000 POPULATION DENSITY (PEOPLE/SQ.MI)	TOTAL S1 S2 AND T&E SPECIES
FORREST	72,604	6.3%	8.45%	299,580	236,588	79%	155.6	46
GEORGE	19,144	14.8%	14.16%	309,261	249,514	80%	40.0	51
GREENE	13,299	30.1%	16.49%	459,632	411,593	90%	18.7	29
HANCOCK	42,967	35.3%	16.97%	306,384	229,837	75%	90.1	54
HARRISON	189,601	14.7%	5.94%	371,709	266,005	71%	326.3	80
JACKSON	131,420	14%	13.46%	467,107	350,060	75%	180.8	131
JONES	64,958	4.7%	5.01%	445,625	338,411	76%	93.6	16
LAMAR	39,070	28.4%	16.65%	318,887	254,989	80%	78.6	26
MARION	25,595	0.2%	6.85%	350,420	270,655	77%	47.2	17
PEARL RIVER	48,621	25.9%	16.13%	522,658	394,085	75%	59.9	45
PERRY	12,138	11.7%	10.01%	415,858	376,639	90%	18.8	56
STONE	13,622	26.7%	17.98%	285,686	249,434	87%	30.6	48
WAYNE	21,216	8.7%	6.62%	519,936	453,196	87%	26.2	29
<b>TOTAL AND AVERAGES</b>	694,255	17.04% avg.	11.9% avg.	5,072,743	4,081,006*	80% avg.	89.72 psm avg.	483 avg.

**\* Total acreage in Southeast Legacy Area: 3,968,778 acres.**

*The total acreage in this legacy area was calculated by the Mississippi Natural Heritage Program as the total area within the 13 counties less the municipalities, roads, public lands and large waterbodies.*





## VALUES AND PRIORITIES FOR CONSERVATION VALUES AND PRIORITIES FOR CONSERVATION IN THE SOUTHEAST FLA

Wet pine savannas/slash pine flatwoods, mesic longleaf pine forests, dry longleaf pine forests, bottomland hardwoods, small stream swamp forests, maritime forests, beech/magnolia forests, pine seeps, Pascagoula River drainage, Lower Pearl River drainage, Black Creek, Leaf River, Wolf River, Biloxi River, Okatoma Creek, Ragland Hills, Leaf River, scenic streams, fallout habitat for neotropical migratory songbirds, Black bear, gopher tortoise, gopher frog, pitcher plant habitat, riparian corridors and forested wetlands along ecoregional priority river/stream reaches, areas adjacent to public lands managed for conservation and mitigation banks, existing private conservation lands, 16<sup>th</sup> Section lands, Important Bird Areas and military installations.

## IMPORTANT PUBLIC LANDS IN THE SOUTHEAST FLA

DeSoto National Forest, Chickasawhay Ranger District, Stennis Space Center, Camp Shelby, Red Creek WMA, Pascagoula River WMA, Wolf River WMA, Leaf River WMA, Old River WMA, Little Biloxi WMA, Ward Bayou WMA, Chickasawhay WMA, Mississippi Sandhill Crane NWR, Grand Bay NWR, Coastal Preserves, Paul B. Johnson State Park, Buccaneer State Park, Shepard State Park, 16th Section lands.

## THREATS TO NATURAL FOREST COMMUNITIES IN THE SOUTHEAST FLA

Significant urban, suburban and exurban sprawl from coastal development and Hattiesburg, recent population shifts within the region generated by Hurricane Katrina, significant recent timber losses from Hurricane Katrina, second home/vacation home development, decades

of fire exclusion, sale of industry lands to individuals, invasive species, road construction, conversion of natural stands to pine plantations and sand and gravel mining.

## NORTHEAST LEGACY AREA – PRIORITY 2

**Ecoregion:** Upper East Gulf Coastal Plain

Parts of six counties comprise the Northeast Legacy Area – Clay, Itawamba, Lee, Lowndes, Monroe and Tishomingo counties.

Figure 21.

### Northeast Mississippi Forest Legacy Areas

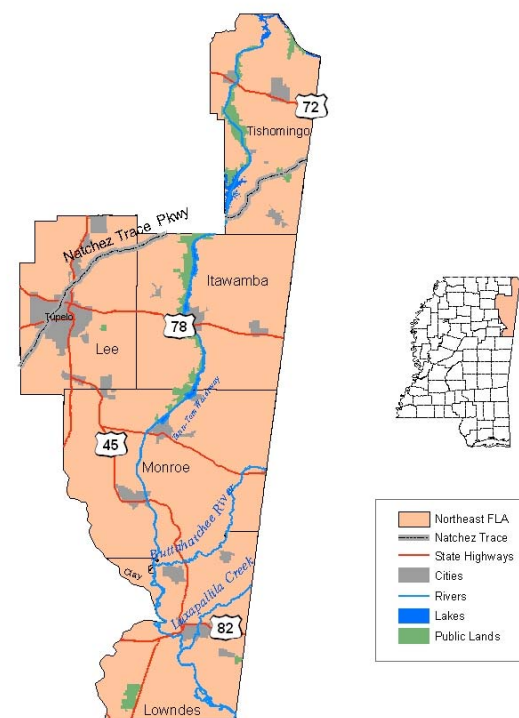


Table 5: Population and Forested Area of the Northeast Legacy Area

COUNTIES	POPULATION (2000)	% GROWTH 1990-2000	% PROJECTED GROWTH 2005-2015	TOTAL ACREAGE IN COUNTY- 2000	FORESTED AREA (ACRES) IN COUNTY- 2000	% FORESTED	2000 POPULATION DENSITY (PEOPLE/SQ.MI)	TOTAL S1 S2 AND T&E SPECIES
CLAY	21,979	4.1%	4.9%	265,832	156,325	59%	53.8	51
ITAWAMBA	22,770	13.8%	6.6%	340,994	263,657	77%	42.8	30
LEE	75,755	15.5%	11.1%	288,349	110,890	38%	168.5	27
LOWNDES	61,586	3.8%	2.16%	329,062	183,014	56%	122.6	60
MONROE	38,014	3.9%	6.45%	491,943	296,143	60%	49.7	57
TISHOMINGO	19,163	8.4%	7.74%	273,716	217,859	80%	45.2	126
TOTAL AND AVERAGES	239,267	8.25 avg.	6.49 avg.	1,989,896	1,227,888*	62%	80.43 avg.	58.5 avg.

\* Total acreage in Northeast Legacy Area: 1,521,006 acres.

The total acreage in this legacy area was calculated by the Mississippi Natural Heritage Program as the total area within Tishomingo, Itawamba, Lee, and those portions of Clay, Lowndes and Monroe County in the Tombigbee watershed, less the municipalities, roads, public lands and large waterbodies.

#### VALUES AND PRIORITIES FOR CONSERVATION IN THE NORTHEAST FLA

Bottomland hardwoods, lower slope/high terrace hardwood forests, dry hardwood forests, dry to mesic hardwood forests, Tombigbee drainage, Northeast Hills/Tennessee River drainage, Buttahatchie River, Tennessee-Tombigbee River, Natchez Trace corridor, scenic streams, riparian corridors and forested wetlands along ecoregional priority river/stream reaches, areas adjacent to public lands managed for conservation and mitigation banks, scenic roads, existing private conservation lands, 16<sup>th</sup> Section lands, Important Bird Areas and military installations.

#### IMPORTANT PUBLIC LANDS IN THE NORTHEAST FLA

Tennessee Tombigbee Waterway, Divide Section WMA, John Bell

Williams WMA, Canal Section WMA, Black Prairie WMA, J.P. Coleman State Park, Tishomingo State Park, Tombigbee State Park, Lake Lowndes State Park, Columbus AFB, Sixteenth Section Lands, Lake Monroe, Elvis Presley Lake, Lake Lamar Bruce.

#### THREATS TO NATURAL FOREST COMMUNITIES IN THE NORTHEAST FLA

Urban and suburban sprawl, fragmentation/subparcelization, invasive species, second home/vacation home development, conversion of natural stands to pine plantations, channel modification, sand and gravel mining, rapid land use and population growth spurred by the construction of the new Toyota manufacturing plant and ancillary businesses.



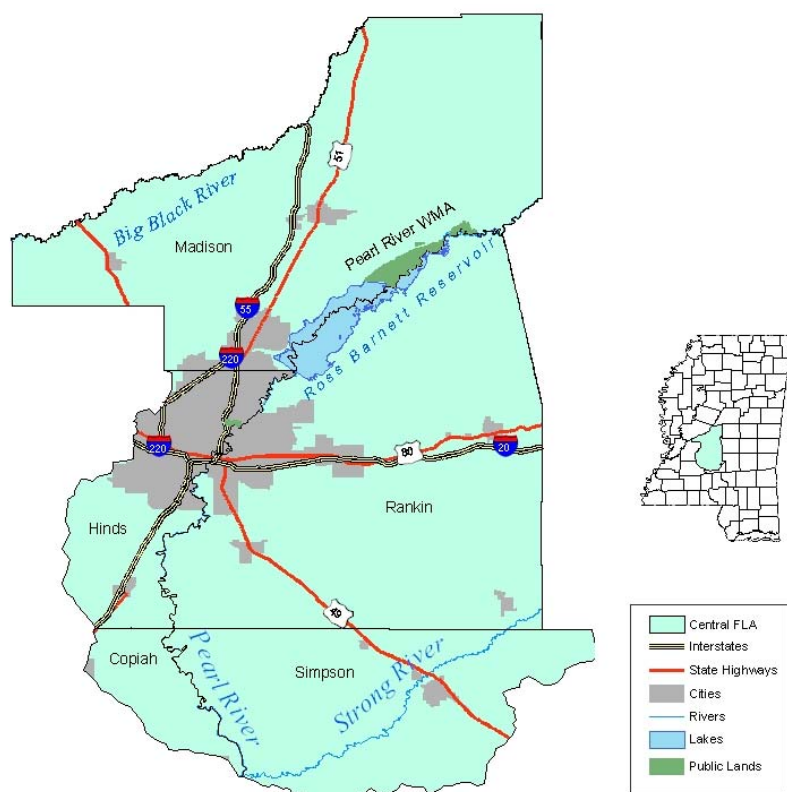
### CENTRAL LEGACY AREA – PRIORITY 3

**Ecoregion:** Upper East Gulf Coastal Plain

Parts of five counties comprise the Pearl River Corridor Legacy Area – Copiah, Hinds, Madison, Rankin and Simpson Counties.

Figure 22:

#### Central Mississippi Forest Legacy Areas



#### VALUES AND PRIORITIES FOR CONSERVATION IN THE CENTRAL FLA

Bottomland hardwoods, bald cypress/gum swamp forests, lower slope/high terrace hardwood forests, Big Black River drainage, Upper and Lower Pearl River drainage, Strong River watershed, Ross Barnett Reservoir, Natchez Trace corridor, riparian corridors and forested wetlands along ecoregional priority river/stream reaches, areas adjacent to public lands managed for conservation and mitigation, existing private conservation lands, Important Bird Areas and 16<sup>th</sup> Section lands.

#### IMPORTANT PUBLIC LANDS IN THE CENTRAL FLA

Natchez Trace National Park, Ross Barnett Reservoir, Pearl River WMA, Copiah County WMA, LeFleurs Bluff State Park, Sixteenth Section lands, Simpson County Lake, Calling Panther Lake.

#### THREATS TO NATURAL FOREST COMMUNITIES IN THE CENTRAL FLA

Metro area sprawl, significant suburban and exurban development, fragmentation/ subparcelization, flood control/channel modification, road construction, sand and gravel mining.



Table 6: Population and Forested Area of the Central FLA

COUNTIES	POPULATION (2000)	% GROWTH 1990-2000	% PROJECTED GROWTH 2005-2015	TOTAL ACREAGE IN COUNTY 2000	FORESTED AREA (ACRES) IN COUNTY 2000	% FORESTED	2000 POPULATION DENSITY (PEOPLE/SQ.MI)	TOTAL S1 S2 AND T&E SPECIES
COPIAH	28,757	4.2%	6.32%	498,298	400,886	80%	37.0	14
HINDS	250,800	-1.4%	4.44%	559,884	329,737	59%	288.5	26
MADISON	74,674	38.8%	20.81%	461,898	263,014	57%	104.1	10
RANKIN	115,327	32.3%	16.77%	497,082	369,722	74%	148.9	12
SIMPSON	27,639	15.4%	7.45%	377,729	296,056	78%	46.9	17
<b>TOTAL AND AVERAGES</b>	497,197	17.8 % avg.	11.16% avg.	2,394,891	1,659,416*	69% avg.	125.08 avg.	15.8 avg.

\* Total acreage in Central Legacy Area: 1,240,003 acres.

*The total acreage in this legacy area was calculated by the Mississippi Natural Heritage Program as the total area within Madison and Rankin Counties, the Pearl River watershed in Hinds, Simpson and Copiah Counties, and Strong River Watershed in Simpson County, less the municipalities, roads, public lands and large waterbodies.*







## SELECTED REFERENCES

2006. Making Clean and Abundant Water Available in the South, Emerging Southwide Issues, USDA Forest Service Southern Research Station, [www.srs.fs.usda.gov](http://www.srs.fs.usda.gov).
- Alig, Ralph J.; Plantinga, Andrew J; Ahn, SoEun; Kline, Jeffrey D. 2003. Land use changes involving forestry in the United States: 1952 to 1997, with projections to 2050. Gen. Tech. Rep. PNW-GTR-587. Portland, OR: U.S. Department of Agriculture, Forest Service, Pacific Northwest Research Station. 92 pp.
- Bailey, Mark, et. al. 2002. Alabama Forest Legacy Program Assessment of Need. Alabama Forest Resources Center, Mobile, Alabama. 79 pp.
- Bailey, R. G. 1995. Description of Ecoregions of the United States. U.S. Forest Service Miscellaneous Publication Number 1391, Washington, D.C. USDA Forest Service.
- Beck, M.W., M. Odaya, J.J. Bachant, J. Bergan, B. Keller, R. Marin, R. Mathews, C. Porter, G. Ramseur. 2000. Identification of Priority Sites for Conservation in the Northern Gulf of Mexico: An Ecoregional Plan. The Nature Conservancy, Arlington, VA.
- Best, Constance and Laurie A. Wayburn. 2001. America's Private Forests: Status and Stewardship. Pacific Forest Trust, Inc., Island Press.
- Cordell, Ken. and C. Overdevest. 2001. Footprints in the Land: An Assessment of Demographic Trends and the Future of Natural Resources in the United States. Sagamore Publishing, Champaign, Illinois.
- Cox, James L. 2001. The Mississippi Almanac – The Ultimate Reference on the State 2001-2002. Rose Printing Company, Tallahassee, Florida. 629 pp.
- Cross, Ralph D. and Robert W. Wales, Editors. 1974. Atlas of Mississippi. University Press, Jackson, Mississippi, 187 pp.
- Daniels, Bob. 1999. Daniels, Bob. 1998. The Importance of forest management and timber harvests in local economies: A Mississippi Example, Southern Perspectives, Vol. 3, No. 2, Southern Rural Development Center.
- Doolittle, Larry. August 1996. An Inventory of Private Landowners in Mississippi, Final Report for the Mississippi Forest Stewardship Committee. Mississippi Agricultural and Forestry Experiment Station, Mississippi State University, 32 pp.
- Fickle, James E. 2004. Timber, A Photographic History of Mississippi Forestry. The University of Mississippi Press, Jackson, Mississippi. 151 pp.



## SELECTED REFERENCES

- Fickle, James E. 2001. Mississippi Forests and Forestry. The University of Mississippi Press, Jackson, Mississippi, 347 pp.
- Fisher, Robbie, Executive Director, The Nature Conservancy, Mississippi Chapter, Personal communication. August, 2005.
- Groves, Craig R.. Drafting a Conservation Blueprint: A Practitioner's Guide to Planning for Biodiversity. The Nature Conservancy: Arlington, Virginia, USA, 445 pp.
- Husak, A.L., S.C. Grado. 2005. Mississippi Urban and Community Forest Management Manual. Forest and Wildlife Research Center, Publication FO 417, Mississippi State University. 191 pp.
- Land Trust Alliance, [www.lta.org](http://www.lta.org)
- Measells, Marcus K., Stephen C. Grado, H. Glenn Hughes. 2004. The Status of Mississippi Forest Landowners. Forest and Wildlife Research Center, Publication No. FO369, Mississippi State University, p 157-166.
- Mississippi Department of Environmental Quality, [www.mdeq.state.ms.us](http://www.mdeq.state.ms.us)
- Mississippi Department of Marine Resources. [www.dmr.state.ms.us](http://www.dmr.state.ms.us)
- Mississippi Forestry Association. 2005. Mississippi Forestry Facts. MFA, Jackson, Mississippi, 2 pp.
- Mississippi Forestry Commission. 2002. Mississippi Forest Stewardship Program State Plan: Natural Resource Management for Mississippi Landowners. 2002-2006. 25 pp.
- Mississippi Forestry Commission. 2004. Mississippi Forest Regeneration Facts, October, 2004. 3 pp.
- Mississippi Hardwood Notes. 2005. Mississippi Forestry Commission
- Mississippi Institutions of Higher Learning. 2002. Mississippi Population Projections, 2005, 2010, 2015. Center for Policy, Research and Planning, IHL. 253 pp.
- Mississippi Land Trust, [www.misslandtrust.org](http://www.misslandtrust.org).
- Mississippi Museum of Natural Science. 2001. Endangered Species of Mississippi.
- Mississippi Department of Wildlife, Fisheries & Parks, Museum of Natural Science, Jackson, Mississippi.
- Mississippi Natural Heritage Program. 2002. Endangered Species of Mississippi.
- Museum of Natural Science, Mississippi Department of Wildlife, Fisheries & Parks. Jackson, Mississippi, 2 pp.
- Mississippi Museum of Natural Science. 2005. Mississippi's Comprehensive Wildlife Conservation Strategy. Mississippi Department of Wildlife, Fisheries and Parks, Mississippi Museum of Natural Science, Jackson, Mississippi.
- Mississippi State University Cooperative Extension Service. [www.msucares.com](http://www.msucares.com)
- NatureServe. 2006. NatureServe Explorer: An online encyclopedia of life [web application]. NatureServe, Arlington, Virginia. <http://www.natureserve.org/explorer>.
- North Carolina Forest Legacy Program Assessment of Need, 1999. [www.ces.ncsu.edu/nreos/forest/legacy/assessment.html](http://www.ces.ncsu.edu/nreos/forest/legacy/assessment.html)



## SELECTED REFERENCES

- Noss, Reed F., and Robert L. Peters. 1995. *Endangered Ecosystems: A Status Report on America's Vanishing Habitat and Wildlife*. Washington, D.C. Defenders of Wildlife.
- Owen, Wayne R. *Southern Forest Resource Assessment. Southern Native Plant Communities in Historical Times*. 2002.
- Pennak, Robert W. 1964. *Collegiate Dictionary of Zoology*. The Ronald Press, New York. 566 pp.
- Petty, David E. 2003. *Mississippi Soil Surveys*. Mississippi State Cooperative Extension Service. [www.msucare.com](http://www.msucare.com)
- Rosson, James F., Jr. 2001. *Forest resources of Mississippi, 1994. Resource Bulletin*
- SRS-61. Asheville, NC: U.S. Department of Agriculture, Forest Service, Southern Research Station. 78 pp.
- Rosson, James F., Jr., 2001, USDA Forest Service, Southern Research Station, Resource Bulletin. SRS-061 available at [www.srs.fs.usda.gov/pubs/2482](http://www.srs.fs.usda.gov/pubs/2482).
- Smith, R.K., P.L. Freeman, J.V. Higgins, K.S. Wheaton, T.W. Fitzhugh, K.J. Ernststrom, A.A. Das. *Priority Areas for Freshwater Conservation Action: A Biodiversity Assessment of the Southeastern United States*. The Nature Conservancy. 2002.
- The Nature Conservancy, May 2002, *Conservation Planning in the Mississippi River Alluvial Plain*.
- The Nature Conservancy and Natureserve, 2001. *East Gulf Coastal Plain Ecoregional Plan*.
- The Nature Conservancy and NatureServe, 2003. *The Upper East Gulf Coastal Plain: An Ecoregional Assessment*.
- USDA Forest Service Forest Legacy Program 5-Year Strategic Direction. December 2005. 11 pp.
- USDA Forest Service. 2000. *RPA Assessment of Forest and Rangelands*, Washington, D.C. Available at [www.fs.fed.us/pl/rpa](http://www.fs.fed.us/pl/rpa).
- USDA Natural Resources Conservation Service. [www.nrcs.usda.gov](http://www.nrcs.usda.gov)
- U.S. Census Bureau, Population Division, *Interim State Population Projections*, 2005.
- U.S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, U.S. Census Bureau. 2001 *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation*.
- Wear, David. 2005. *Rapid Changes in Forest Ownership Increase Fragmentation*. *Compass*, Fall 2005. p. 8-9.



THIS PAGE LEFT  
BLANK INTENTIONALLY.





## ACKNOWLEDGEMENTS

This Assessment of Need is the result of many meetings, research and input by numerous individuals, agencies and organizations. Sincere thanks to the members of Mississippi's **Forest Stewardship Committee** for their time and energy throughout the development of this AON.

James Austin

Don Brazil, MS Department of Wildlife, Fisheries and Parks

Steve Butler, Association of Consulting Foresters

Daniel Coggin, MS Land Trust

Bob Daniels, Extension Forester, MS State Extension Service

Steve Demarais, College of Forest Resources, MS State University

Stephen Dicke, Extension Forester, MS State Extension Service

Robbie Fisher, The Nature Conservancy

Sandra Ford, Alcorn State University

Alan Holditch, USDA Natural Resources Conservation Service

Joe Koloski, National Wild Turkey Federation

Jim Lipe, MS Dept of Agriculture and Commerce

Steve Melton, USDA Farm Service Agency

MS Soil and Water Conservation Commission

Tom Monaghan, Program Coordinator, MS Forestry Association

Don Neal, USDA Forest Service

Steve Ozier





## ACKNOWLEDGEMENTS

Gilbert Ray, US Fish and Wildlife Service

Clovis Reed, MS Department of Environmental Quality

Jim Shepard, Department of Forestry, Institute of Furniture  
Manufacturing and Management

Frank Taylor

Eleana Turner Pope

Ramsey Russell

Bobby Watkins, Steward of the Year 2005

Very special thanks to the members of the **Forest Legacy Subcommittee** and other stakeholders for their guidance and recommendations on the Forest Legacy Areas in Mississippi and their review and input on this document.

Elizabeth Barber, Barber and Mann, Inc.

Don Brazil, MS Department of Wildlife, Fisheries and Parks

Daniel Coggin, MS Land Trust

Trey Cooke, Delta Wildlife

Robbie Fisher, The Nature Conservancy

Debbie Gaddis, MS State Extension Service

Kent Grizzard, MS Forestry Commission

Matt Hicks, MS Museum of Natural Science

Larry Jarrett, Natural Resources Initiative of North Mississippi

Grant Larsen, MS Department of Marine Resources

Charles Knight, MS Department of Wildlife, Fisheries and Parks,  
Museum of Natural Science

Tom Mann, MS Museum of Natural Science

Matthew Miller, The Nature Conservancy

Ronnie Myers, MS Forestry Commission

Don Neal, USDA Forest Service

Bob Piazza, Mississippi Army National Guard

Clovis Reed, MS Department of Environmental Quality

Randal Rometry, MS Forestry Commission

Cathy Shropshire, MS Wildlife Federation

Darlene Slater, MS Forestry Commission

Delmer Stamps, UDA Natural Resources Conservation Service

Judy Steckler, Land Trust for the Mississippi Coastal Plain

John Tindall, MS Department of Wildlife, Fisheries and Parks

Don Underwood, MS Soil and Water Conservation Service

We also wish to thank Charlie Morgan, State Forester, and the staff of the Mississippi Forestry Commission for their hard work, cooperation and patience in this development process and to Liz Crane, USDA Forest Service for her guidance and advice throughout.

Thanks to Kent Grizzard for his public outreach skills and to Randal Rometry for digital map work.

We appreciate the guidance and assistance of the Alabama Forest Resources Center and the Alabama Forestry Commission for allowing us to adapt parts of their successful Forest Legacy Program plans in the development of this AON.



## ACKNOWLEDGEMENTS

We appreciate the Mississippi Department of Wildlife, Fisheries and Park's Natural Heritage Program and the Museum of Natural Science staff, especially Matt Hicks, Tom Mann, and Charles Knight, for their data, photographs and input on the Forest Legacy Areas.

Special thanks to Ron Weiland for the natural community descriptions.

Compiled and written by: Elizabeth Rooks-Barber, Barber and Mann, Inc.

Design and formatting by Kim Smith.



THIS PAGE LEFT  
BLANK INTENTIONALLY.

